

# To Teach or Not to Teach?

U.S. Department of Education  
NCES 2007-163

**Teaching Experience and  
Preparation Among 1992-93  
Bachelor's Degree Recipients  
10 Years After College**

**Statistical Analysis Report**



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**Statistical Analysis Report**

July 2007

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## **Executive Summary**

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Efforts to increase student achievement have focused in recent years on improving teaching in the United States. Programs implementing higher standards for curricula, student performance, and, especially, teachers' preparation and inservice training have been cornerstones of recent reforms (Hirsch, Koppich, and Knapp 2001; Potts, Blank, and Williams 2002). To ensure a highly qualified teacher for every child, the No Child Left Behind Act and related state policies now require that teachers hold a bachelor's degree and full certification in their field. Two common goals are attracting more skilled people to the profession and retaining teachers at higher rates, particularly new teachers.

Interest in the teaching workforce often focuses on the characteristics of college graduates who choose teaching and who later decide to stay in the profession, and how teachers compare to their counterparts in other professions (Hanushek, Kain, and Rivkin 2004; Henke and Zahn 2001). This report profiles 1992–93 bachelor's degree recipients' experience with K–12 teaching in the subsequent 10 years, and their preparation for teaching. The analysis compares current and former teachers among this cohort on many measures, and contrasts these groups with graduates who never taught (where appropriate). It uses data from the 2003 Baccalaureate and Beyond Longitudinal Study (B&B:93/03), the final follow-up survey of students who received their bachelor's degrees in 1992–93 (B&B:93).

The B&B:93 sample was drawn primarily from eligible respondents in the 1993 National Postsecondary Student Aid Study (NPSAS:93), a nationally representative sample of all students in postsecondary education institutions in the 50 states, the District of Columbia, and Puerto Rico.

The analysis uses standard *t*-tests to determine statistical significance of differences between estimates, and one-way Analysis of Variance (ANOVA) to detect linear relationships between one ordered and one other variable. All differences reported in the text are statistically significant at the  $p < .05$  level.

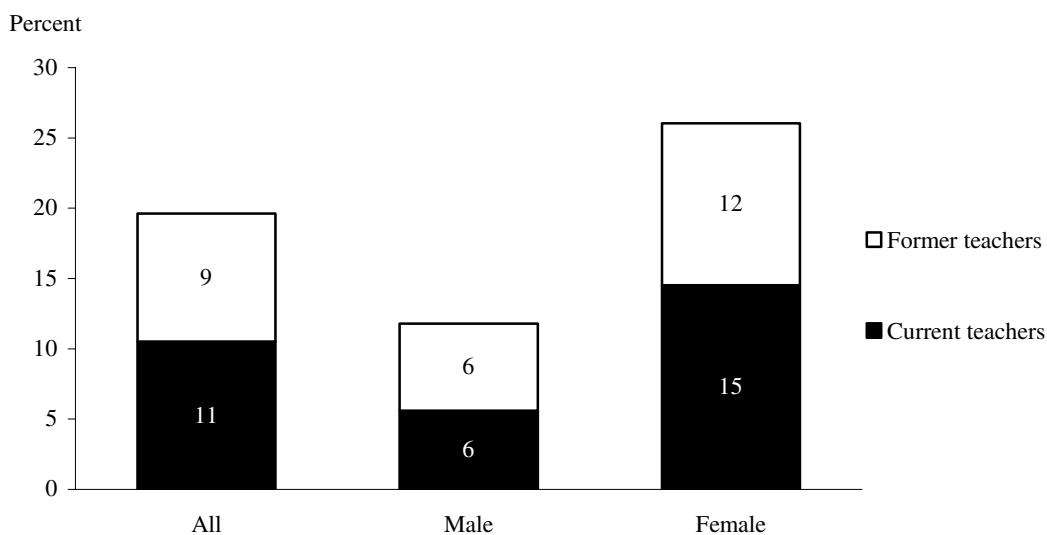
### **Teaching Status of 1992–93 Graduates in 2003**

In this study, teachers are defined as bachelor's degree recipients who had worked as teachers of any grade K–12. This definition excludes those who worked only as long- or short-term substitutes or teacher's aides, and those who taught only preschool grades.

Through spring 2003, one-fifth (20 percent) of 1992–93 bachelor's degree recipients had taught in an elementary or secondary school (figure A and text table 1). Approximately 11 percent of these graduates were teaching when interviewed in 2003, and another 9 percent had taught at some point but were not teaching at the time of the interview.

**Figure A. Percentage of 1992–93 bachelor's degree recipients who were current or former teachers, by gender: 2003**

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NOTE: Estimates include graduates from the 50 states, DC, and Puerto Rico.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

## ***Demographic Characteristics***

Consistent with historical precedent (Grant and Murray 1999), in 2003 women were more likely than men to report that they were currently teaching (15 percent vs. 6 percent) or had taught previously (12 percent vs. 6 percent) (figure A and text table 1). Overall, 26 percent of the female graduates had taught at some point, compared with 12 percent of the males (text table 1). Asian/Pacific Islander graduates in this cohort were less inclined than others toward a teaching career; 93 percent of Asian graduates had never taught by 2003, compared with 75 to 80 percent of graduates of other racial/ethnic backgrounds. Graduates who were age 30 or older when they completed their 1992–93 bachelor's degrees were also in general more

likely than younger graduates to be teaching when they were interviewed in 2003.

## ***Academic Characteristics***

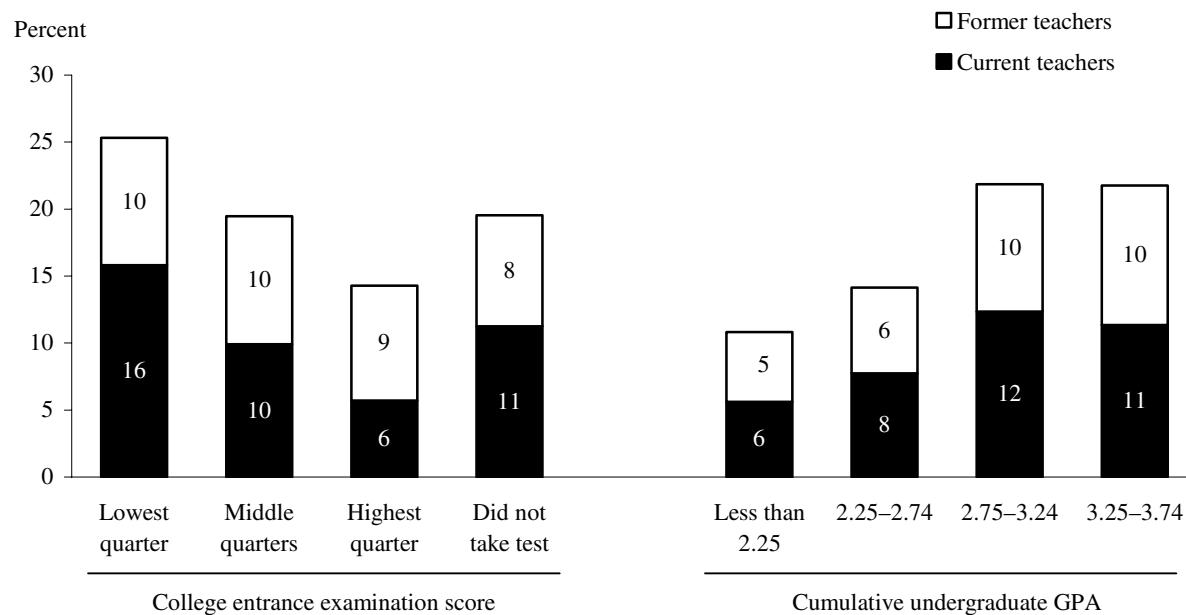
Graduates of public nondoctoral institutions were more likely than others to be teaching in 2003 (text table 2). While 17 percent of public nondoctoral institution graduates reported teaching in 2003, among graduates from other institution types, 11 percent or fewer were teaching in 2003 (figure 2 and text table 2).

Approximately 71 percent of education majors among 1992–93 graduates had taught by 2003: 43 percent were teaching at the time of the interview, and 29 percent had taught but were not currently teaching (figure 3 and text table 2). Education majors were more likely than those

who majored in any other discipline to be teaching in 2003 and to have prior teaching experience. However, 57 percent of all education majors were not teaching in 2003—29 percent who had never taught plus 29 percent who were former teachers.<sup>1</sup> The data also indicate lower attrition rates from teaching among education majors than among majors in other fields.

Graduates' scores on college entrance examinations (i.e., the SAT or ACT) were inversely related to their subsequent likelihood of teaching in 2003. For example, 16 percent of graduates with college entrance examination (CEE) scores in the lowest 25 percent of the distribution were teaching in 2003, compared with 10 percent of those in the middle half of the score distribution and 6 percent of those with the highest scores (figure B and text table 2).

**Figure B. Percentage of 1992–93 bachelor's degree recipients who were current or former teachers, by college entrance examination score and normalized undergraduate GPA: 2003**



NOTE: Estimates include graduates from the 50 states, DC, and Puerto Rico.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

<sup>1</sup> Although the two estimates each round to 29 and thus their sum would appear to be 58, summing the unrounded estimates produces 57.4.

On the other hand, as college grade point average (GPA) increased, graduates were more likely to have past teaching experience and in general were more likely to be teaching in 2003 (figure B).

About 34 percent of 1992–93 graduates whose highest earned degree was a master's—and 47 percent of those who attained a post-baccalaureate certificate—had taught at some point by 2003 (figure 5 and text table 2). In contrast, 16 percent of graduates whose highest degree was a bachelor's and 10 percent of those who earned a credential higher than a master's degree had taught by 2003.

## **Teachers' Job Characteristics and Opinions About Teaching**

### ***Characteristics of Teaching Job***

Among graduates who were teaching in 2003, 91 percent were teaching in a public school and 64 percent in an elementary school (figure 6 and text table 3). Graduates who were teaching in 2003 were more likely than graduates who had taught only previously to work at a public school. General elementary was the main assignment field reported by 35 percent of these graduates, and 18 percent taught science or mathematics (figure 7).

### ***Job Satisfaction and Plans for Continuing to Teach***

Nearly all graduates (93 percent) who were teaching in 2003 expressed overall satisfaction with that job (figure C). Teachers were more likely to be satisfied with the learning environment at their 2003 school (77 percent)

than with such aspects as pay, parent support, and students' motivation to learn (48 percent of teachers were satisfied with each of these aspects).

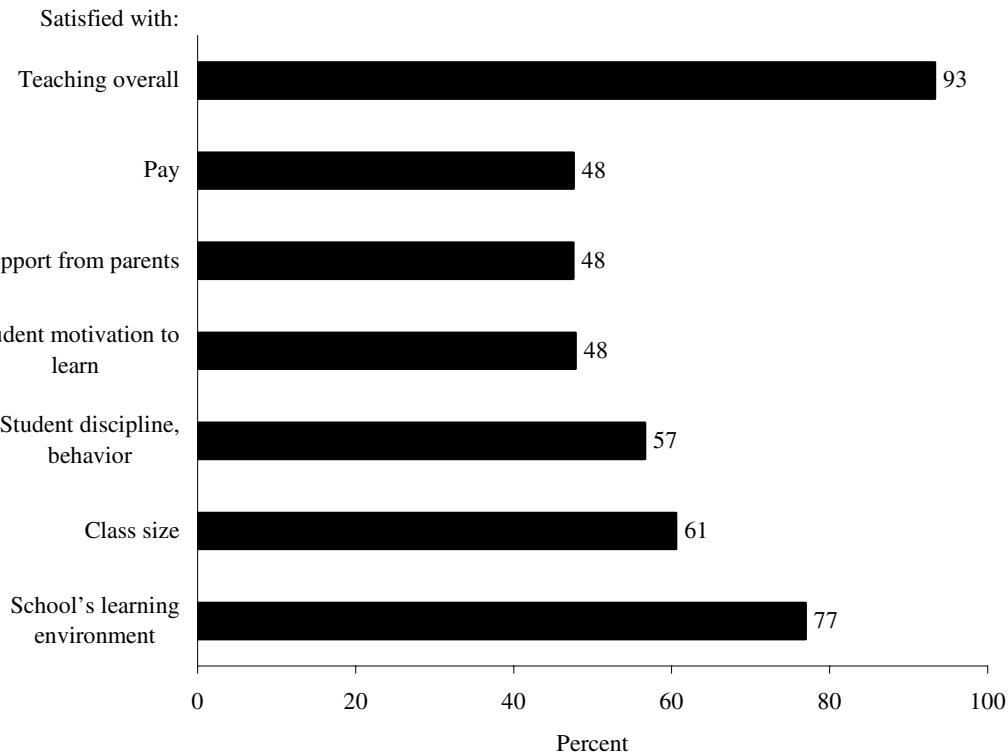
On other measures reflecting job satisfaction, 90 percent of 2003 teachers reported that they would choose teaching again, and 2 in 3 (67 percent) said they would remain a teacher for the rest of their working life (text table 4). Male and female teachers did not differ measurably in how long they planned to remain in the profession. However, more male than female teachers (94 vs. 88 percent) said they would choose teaching if they had a chance to make the decision again (figure 9). White teachers were more likely than Black teachers to plan to teach until retirement (70 vs. 37 percent; figure D).

### ***Reasons for Not Teaching in 2003***

About 11 percent of the 1992–93 cohort were teaching in 2003, and 9 percent had taught but were not currently teaching (text table 2). Roughly as many graduates had thus left teaching as had stayed in the field by 2003, whether leaving was on a temporary or permanent basis.

One-fifth of teachers who left teaching by 2003 cited raising children or other family demands as their main reason for leaving (text table 5). Other common reasons for leaving teaching were to take jobs outside of education (18 percent) or nonteaching jobs in education (15 percent), because of low pay (13 percent), and "other"—an unspecified reason (22 percent). Male teachers were more likely than females to leave for a job outside of education, while females were more likely to leave for family-related reasons.

**Figure C. Among 1992–93 bachelor's degree recipients who were teaching in 2003, percentages who were satisfied with teaching overall and with various aspects of teaching: 2003**



NOTE: School and job characteristics apply to respondents' current teaching job. Estimates include graduates from the 50 states, DC, and Puerto Rico.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

## Preparation for Teaching

### *Progress Through the Teacher Pipeline*

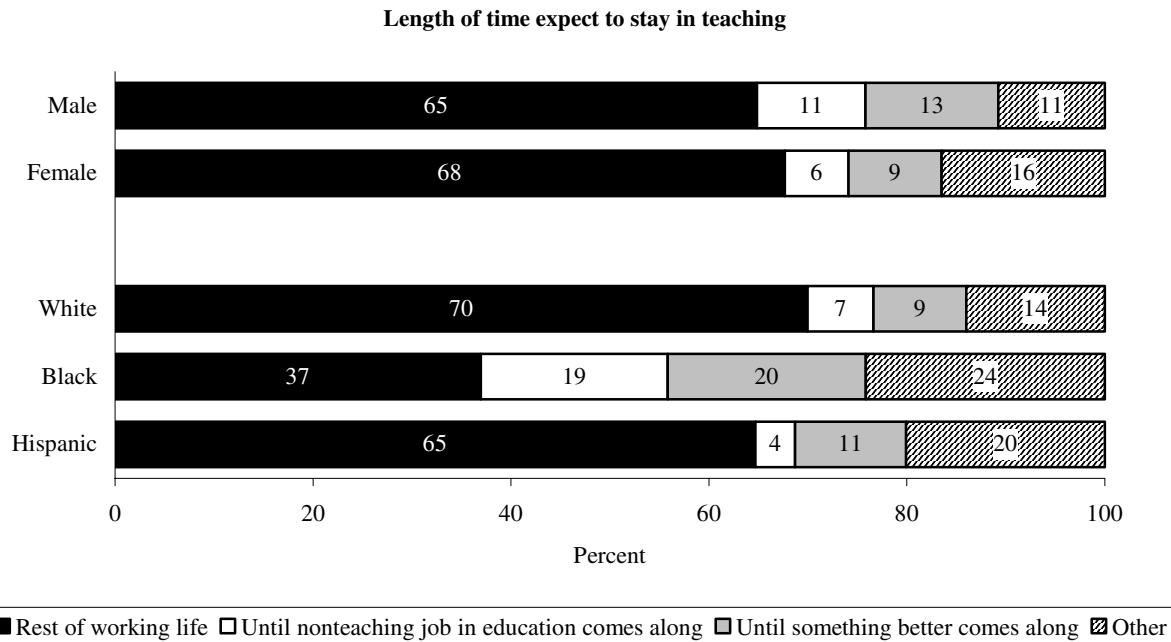
Nearly one-half (46 percent) of all 1992–93 bachelor's degree recipients had either not considered teaching or not taken any steps to prepare for the profession (figure 12 and text table 6). Another 30 percent had either considered teaching or applied for a teaching job at some point in the previous decade. While 16 percent had both prepared to teach and taught,

roughly 4 percent each had taught with no training or prepared but had not taught. Males and Asians/Pacific Islanders in the cohort were less likely than females and those from other racial/ethnic groups to have considered teaching or taken steps toward a teaching career (text table 6).

Being prepared to teach is defined in this report as having earned a teaching certificate or having completed a student teaching assignment (which usually occurs toward the end of a

**Figure D. Among 1992–93 bachelor's degree recipients who were teaching in 2003, percentage distribution by length of time they expected to stay in teaching, by gender and race/ethnicity: 2003**

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NOTE: Black includes African American and Hispanic includes Latino. Race categories exclude Hispanic origin. Detail may not sum to totals because of rounding. Estimates include graduates from the 50 states, DC, and Puerto Rico.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

teacher preparation program).<sup>2</sup> Characteristics associated with preparing for and becoming a teacher included having earned a different bachelor's degree before the 1992–93 degree, earning the latter degree from a public non-doctorate-granting institution, and having majored in education as an undergraduate. Graduates who had higher college grades were also more likely to have gained teaching experience and to have completed preparation to

teach by 2003. On the other hand, as CEE scores increased, graduates were less likely to have prepared and to have taught by 2003. Having either taught or trained to teach before completing the 1992–93 degree were other predictors of preparing and teaching by 2003.

### ***Student Teaching and Certification***

Overall, 4 in 5 of 1992–93 bachelor's degree recipients had not prepared to teach by 2003 (text table 7), while 17 percent earned teaching certificates. Another 3 percent had completed student teaching but not all requirements for certification. Graduates who were relatively

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<sup>2</sup> Most states' certification requirements for public school teachers include a period of student teaching—either directly or indirectly (e.g., states may require teachers' education programs to include student teaching and require all prospective teachers to complete such a program).

likely to earn teaching certification included females (figure E and text table 7), Whites and Blacks (vs. Asians/Pacific Islanders), those who graduated from public non-doctorate-granting postsecondary institutions, and those who majored in education.

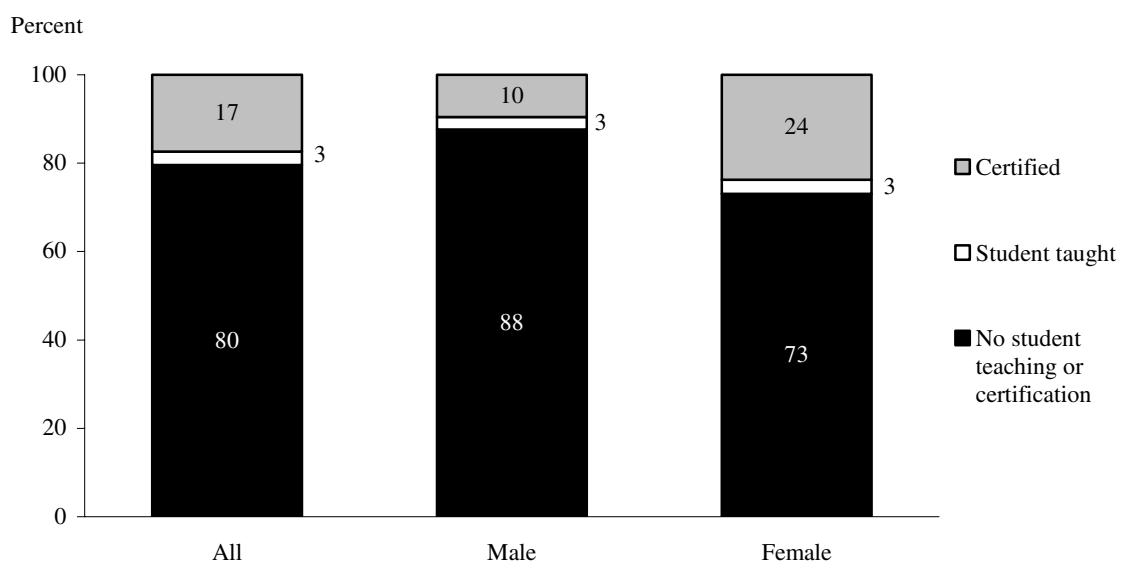
### **Reasons for Deciding Not to Teach**

Among the 1992–93 graduates who had considered teaching but had not entered the profession, 36 percent cited lack of interest in teaching, 30 percent reported having another job already, and 25 percent sought higher pay (text table 8). Males were more likely than females to

have sought higher pay, gotten another job, and received a better offer than teaching (figure 14).

Graduates whose attainment before the 1992–93 bachelor's degree was less than a bachelor's were also more likely than those with higher prior attainment to report seeking higher pay as their reason for not teaching (25 percent vs. 14 percent). As their CEE scores increased, 1992–93 graduates were more likely to select the following reasons for not entering teaching: poor working conditions, low pay, and having another job already. Graduates with relatively high college grades were less likely than those with lower grades to say that lack of teacher certification played a role in the decision.

**Figure E. Percentage distribution of 1992–93 bachelor's degree recipients by preparation to teach, by gender: 2003**



NOTE: Detail may not sum to totals because of rounding. Estimates include graduates from the 50 states, DC, and Puerto Rico.  
 SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

## **Foreword**

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This report profiles the K–12 teaching experience and preparation of 1992–93 bachelor's degree recipients in the 10 years following their college graduation. The data upon which the report is based were collected as part of the final follow-up of the first long-term study of bachelor's degree recipients conducted by the National Center for Education Statistics (NCES) in the U.S. Department of Education. The sample was obtained by identifying eligible respondents from the 1993 National Postsecondary Student Aid Study (NPSAS:93), a nationally representative cross-section of all students in postsecondary education institutions in the 50 states, the District of Columbia, and Puerto Rico. As part of NPSAS:93, information was obtained from postsecondary institutions and through telephone interviews with students. Those members of the NPSAS:93 sample who completed a bachelor's degree between July 1, 1992, and June 30, 1993, were identified and contacted for a 1-year follow-up interview in 1994, the Baccalaureate and Beyond Longitudinal Study (B&B:93/94). These graduates were interviewed a second time in 1997, and in a third and final follow-up interview approximately 10 years after they had received their bachelor's degrees (B&B:93/03).

The estimates presented in the report were produced using the NCES Data Analysis System Online (DAS), a web-based table-generating application that provides the public with direct, free access to the B&B:93/03 data as well as other postsecondary data collected by NCES. The DAS produces the design-adjusted standard errors necessary for testing the statistical significance of differences between estimates. For more information about the DAS, readers should consult appendix B of this report.

## Acknowledgments

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Jennifer Wine at RTI International served as project director for the B&B:93/03 data collection, and this report would not exist without her skillful management and the hard work of the entire RTI team on the project. We particularly appreciate the work of Kimberly Ault and Sara Wheless, who contributed sections to the technical appendix on bias analysis and imputation procedures.

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## **Introduction**

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Education affects the lives of most people in the United States, even beyond the large number of students, teachers, other education workers, and parents who are directly involved in schooling. Public opinion varies on the quality of elementary/secondary education, with only 9 percent of adults saying they were “completely satisfied” with it, and 37 percent choosing “somewhat satisfied” in a recent national survey (Public Agenda 2005). Furthermore, the public’s interest in reform and reaching improved outcomes for students is strong. For example, in 2006, improving education ranked second among 22 issues in the percentage of adults who rated it as a top priority (67 percent) or important but a lower priority (26 percent) for action at the federal level (Public Agenda 2006). Partly in response to U.S. students’ low performance on achievement tests, particularly in an international context, experts, government agencies, and the public support improving students’ skills and knowledge in all subjects.

Teacher quality has been a focus of recent state laws and the 2002 reauthorization of the federal Elementary/Secondary Education Act, or No Child Left Behind (NCLB). The NCLB Act addresses teacher quality in at least two ways: Title I’s accountability provisions require schools that receive federal funds to ensure that only highly qualified teachers teach academic subjects, and Title II provides funding for recruiting and training high-quality teachers and principals. In addition, many states have adopted policies intended to improve the quality of teaching, among them reducing class sizes and revising teacher training and certification standards (Hirsch, Koppich, and Knapp 2001; Potts, Blank, and Williams 2002).

NCLB and related state policies specify minimum qualifications that all teachers must have, while aiming to avoid creating barriers that could unnecessarily reduce the teacher supply. (Demand for teachers depends primarily on exogenous forces like economic and population growth and tax revenue, although policies on class size and other matters can influence demand—in recent years mostly increasing it.) Nationally, the annual supply of new teachers is in general adequate to fill most openings in most years, although some positions are difficult to fill in certain disciplines and geographical areas (including in certain states), and in low-performing schools (American Association for Employment in Education 2002; Curran, Abrahams, and Manuel 2000).

In order to provide adequate teacher supply, in both quality and quantity, schools and districts work on recruiting qualified people to teaching and on retaining them. The first section

of this report describes the academic and demographic characteristics of 1992–93 bachelor’s degree recipients who went into teaching and those who did not. Data on graduates who entered the teacher supply pipeline, and whether they completed teacher certification and went on to teach, are discussed in the report’s second section. That section also covers data on the main reasons graduates who did not teach had for deciding against teaching, and whether those reasons differed by a range of characteristics.

This report provides data related to retention by examining the teaching experience and attrition rates over the first 10 years by 1992–93 bachelor’s degree completers.<sup>1</sup> In addition, for those graduates who taught at some point since receiving the bachelor’s degree but who were not teaching in 2003, the report discusses the main reason they were not teaching in 2003. In addition to recruitment, retaining new teachers in the profession and reducing staff turnover, especially in hard-to-staff schools, have become focal points for improving teacher quality (Ingersoll and Smith 2003). Some teachers leave the profession within the first few years, making it difficult for certain schools and districts to find replacements. In addition, teacher turnover favoring schools in more affluent districts can lead to less affluent districts having higher rates of inexperienced or less qualified teachers. Research evidence suggests that teachers with very little experience, particularly those in their first year of teaching, are less effective than others and that teacher quality improves notably in the first few years (Hanushek et al. 2005). Therefore, retention efforts seek to help novice teachers improve their craft during the first year or two, to increase the likelihood that they stay in teaching and are able to educate children well.

The report begins with a discussion of the data and methodology upon which the estimates and analysis are based. Next, the report discusses the teaching status of 1992–93 college graduates in 2003, attending to variation in teaching by demographic characteristics and undergraduate academic characteristics and experiences. In addition, teachers’ satisfaction with teaching and plans for staying in the profession are analyzed, along with reasons that teachers gave for not teaching in 2003. The report’s second section concludes by studying graduates’ entry into the teacher supply pipeline and preparation to teach, again examining variation by demographic and academic characteristics. The variables used in this report are defined in appendix A (the glossary), and additional information about the B&B:93/03 data is presented in appendix B.

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<sup>1</sup> “Attrition” here is not restricted to permanent departures from the teaching profession. The category includes all teachers who were not teaching in 2003, some of whom may later return to teaching. (It does not include teachers who change schools.)

## Data and Methods

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Using data from the 1993–2003 Baccalaureate and Beyond Longitudinal Study (B&B:93/03), this report provides a description of the teaching experience and teacher preparation activities of 1992–93 college graduates 10 years after bachelor’s degree receipt. The B&B:93/03 sample was based on respondents to the 1993 National Postsecondary Student Aid Study (NPSAS:93) who completed a bachelor’s degree in the 1992–93 school year.<sup>2</sup> NPSAS:93 includes a nationally representative cross-section of all students in postsecondary education institutions in the 50 states, the District of Columbia, and Puerto Rico. For NPSAS:93, information was obtained from more than 1,000 postsecondary institutions on approximately 50,000 undergraduate students and more than 13,000 graduate students. Those members of the NPSAS:93 sample who completed a bachelor’s degree between July 1, 1992, and June 30, 1993, were identified and contacted for a 1-year follow-up interview in 1994 and for a second follow-up in 1997. Data from the final follow-up, conducted 10 years after the initial data collection (B&B:93/03), form the basis of this report.

The estimates in this report are based on the reports of approximately 8,100 bachelor’s degree recipients, representing about 1.2 million people who completed a bachelor’s degree in 1992–93. The 2003 Internet-based survey was either self-administered by respondents or administered over the telephone by trained interviewers. The weighted overall response rate for the B&B:93/03 interview was 73.6 percent, reflecting an institution response rate (in 1992) of 88.2 percent and a student response rate (in 2003) of 83.4 percent. For more information about B&B:93/03, see appendix B.

All comparisons made in the text were tested using the Student’s *t* statistic for comparing two estimates or one-way Analysis of Variance (ANOVA), incorporating *F*-tests, to detect linear relationships between one ordered and one other variable, as well as overall significance. All differences cited were statistically significant at the .05 level. The formulas used for *t*-tests and more detail on significance levels are provided in appendix B.

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<sup>2</sup> In addition to this main source for B&B:93 sample members, some graduates were identified using institutional records.

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## Teaching Status of 1992–93 Graduates in 2003

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In this study, teachers are defined as bachelor's degree recipients who had worked as teachers of any grade K–12; excluded are those who worked only as long- or short-term substitute teachers or teacher's aides, and those who taught only preschool grades. Cohort members considered as teachers in this report include all graduates who had earned a bachelor's degree in 1992–93 and had taught at some point, regardless of teaching experience and teacher training before earning that bachelor's degree.<sup>3</sup>

By 2003, one-fifth (20 percent) of 1992–93 bachelor's degree recipients had taught in an elementary or secondary school since completing the 1992–93 bachelor's degree (figure 1 and table 1). Approximately 11 percent were teaching when they were interviewed in 2003, and another 9 percent had taught at some point but were not teaching at the time of the interview.<sup>4</sup>

### Demographic Characteristics

Teaching has been a female-dominated profession in the United States for well over a century (Grant and Murray 1999). The cohort of 1992–93 bachelor's degree recipients continued this long tradition of gender difference in the first few years after graduating from college (Henke, Chen, and Geis 2000; Henke, Geis, and Giambattista 1996). Ten years after completing their bachelor's degrees, as well, women in the 1992–93 cohort were more likely than men to report in 2003 that they were currently teaching (15 percent vs. 6 percent) or had taught previously (12 percent vs. 6 percent) (figure 1 and table 1). Overall, about one-quarter of women had taught at some point, compared with 12 percent of men. In addition, women were more inclined to have taken steps toward a teaching career (e.g., to have considered teaching, applied for teaching positions, or undertaken professional preparation for teaching), discussed in the latter section of this report.

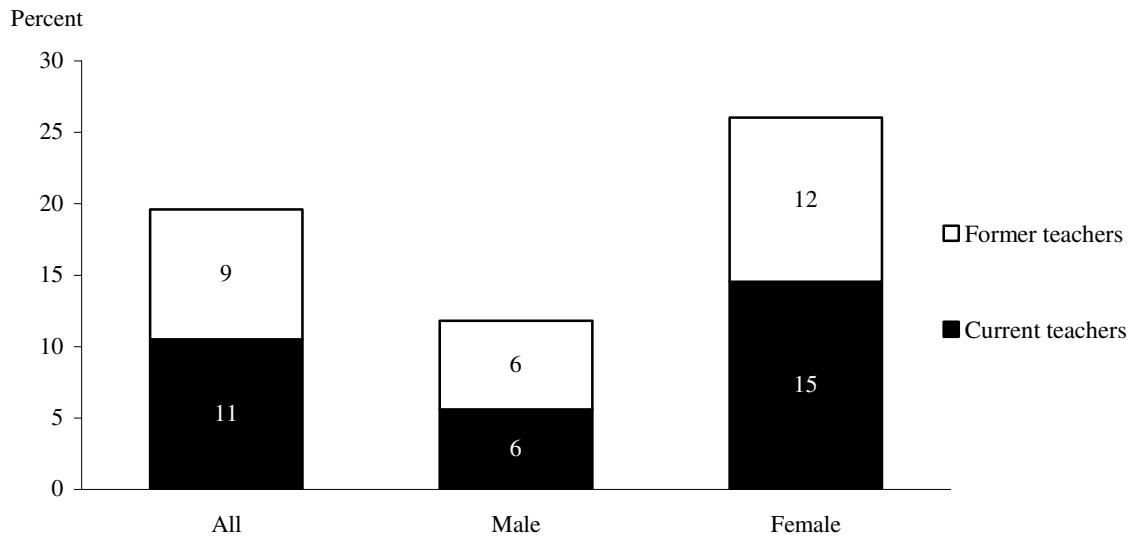
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<sup>3</sup> In order to examine the complete group of current and former teachers, this report includes those who had either taught or trained to teach for at least 1 year before earning the 1992–93 degree, about 3 percent of the cohort. This small group was excluded from some previous reports that discussed bachelor's degree recipients and teaching experience (Henke, Geis, and Giambattista 1996; Henke, Chen, and Geis 2000). Note also that the small proportion of 1992–93 bachelor's degree recipients who had earned a previous bachelor's degree are also included.

<sup>4</sup> When 2003 is used in the text, and table and figure titles, in this report, it generally means at the time of the follow-up interview conducted in that year. The short form is used for readability.

**Figure 1. Percentage of 1992–93 bachelor's degree recipients who were current or former teachers, by gender: 2003**

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NOTE: Estimates include graduates from the 50 states, DC, and Puerto Rico.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

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Relative to graduates of other racial/ethnic backgrounds, Asian/Pacific Islander graduates in this cohort were less inclined toward a teaching career. In 2003, for example, approximately 93 percent of Asian graduates had never taught, compared with 75 to 80 percent of graduates of other racial/ethnic backgrounds (table 1). This finding is consistent with the teaching experience patterns observed earlier with this cohort and in the 1-year follow-up of 1999–2000 bachelor's degree recipients, in which Asian bachelor's degree recipients were less likely than other graduates to pursue a teaching career in their first year out of college (Henke, Chen, and Geis 2000; Henke et al. 2005).

The age of graduates when they completed their 1992–93 bachelor's degree was related to the likelihood that they were teaching in 2003. Graduates who were at least 30 years old when they completed their 1992–93 bachelor's degree were in general more likely to be teaching in 2003 than those who were younger. The proportions who were teaching ranged from 9 percent of those ages 25–29 to 14 percent of those who were at least 30 when they completed the degree. Among those with teaching experience, the youngest degree earners (age 22 or younger when completing their bachelor's degree) were about evenly split between current and former teachers.

**Table 1. Percentage distribution of 1992–93 bachelor's degree recipients' teaching status, by demographic characteristics: 2003**

Demographic characteristics	Taught at some point			
	Total	Currently teaching	Not currently teaching	Never taught
Total	19.6	10.5	9.1	80.4
Gender				
Male	11.8	5.6	6.2	88.2
Female	26.0	14.5	11.5	74.0
Race/ethnicity <sup>1</sup>				
White	19.9	10.6	9.3	80.1
Black	20.5	11.9	8.6	79.5
Hispanic	24.8	14.5	10.4	75.2
Asian/Pacific Islander	7.1	2.5	4.6	92.9
Age at bachelor's degree completion				
22 or younger	20.0	10.0	10.1	80.0
23–24	18.0	10.3	7.8	82.0
25–29	18.0	8.7	9.4	82.0
30 or older	22.1	13.9	8.2	77.9

<sup>1</sup> Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin. Included in the totals but not shown separately are data for respondents who identified themselves as American Indian/Alaska Native or another race.

NOTE: Detail may not sum to totals because of rounding. Estimates include graduates from the 50 states, DC, and Puerto Rico.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

However, those earning their degrees at age 30 or older were more likely to be teaching in 2003 than to have left teaching (14 vs. 8 percent).

## Academic Characteristics

This section examines how graduates' teaching experience related to their postsecondary education experiences, primarily to aspects of their undergraduate education. First, variation in teaching experience is analyzed according to the type of institution from which graduates earned their bachelor's degree and to their major field of study. This section also shows how teaching varied with the highest degrees graduates had attained by 2003, as well as their performance in

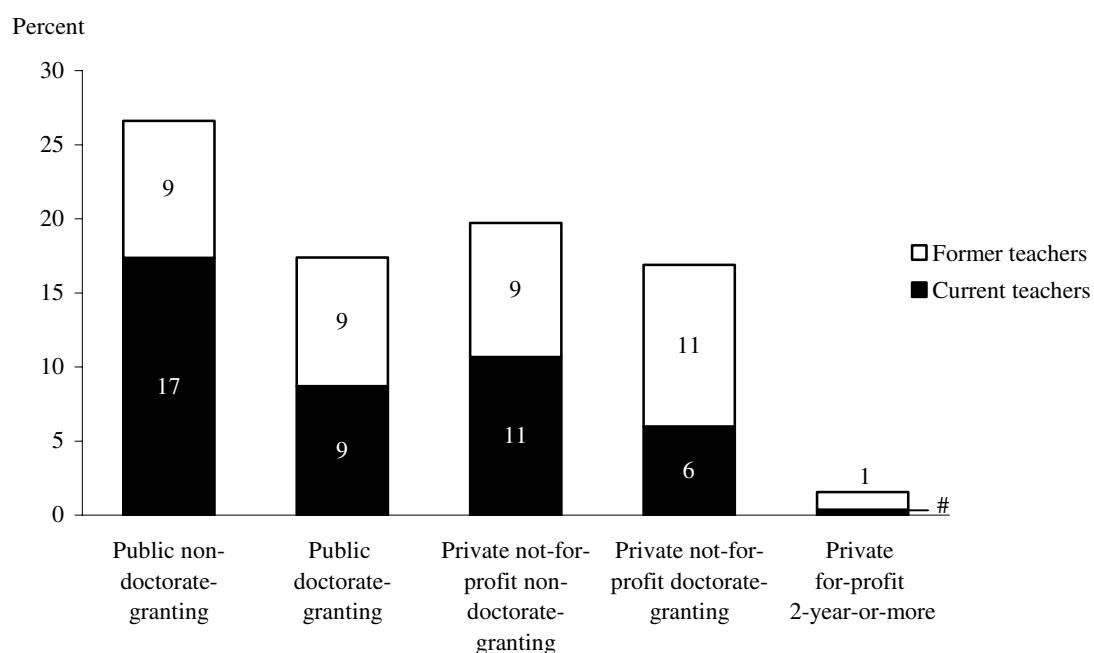
college (measured by average grades) and their pre-college academic skills, measured by college entrance examination (CEE) scores.<sup>5</sup>

### ***Undergraduate Institution Type***

Public non-doctorate-granting institutions stand out as the institution type whose graduates were most likely to be teaching 10 years after receiving their bachelor's degree. Seventeen percent of 1992–93 bachelor's degree recipients from public nondoctoral institutions reported teaching in 2003; a maximum of 11 percent of graduates from the other four institution types shown in table 2 were teaching in 2003 (figure 2). Students who graduated from private for-profit schools were particularly unlikely to become teachers in the next decade; 98 percent of them had never taught by 2003.

**Figure 2. Percentage of 1992–93 bachelor's degree recipients who were current or former teachers, by type of bachelor's degree-granting institution: 2003**

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# Rounds to zero.

NOTE: Estimates include graduates from the 50 states, DC, and Puerto Rico.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

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<sup>5</sup> CEE scores used in this report are a composite of available SAT and/or ACT scores (combining mathematics and verbal test scores). See appendix A for further information.

**Table 2. Percentage distribution of 1992–93 bachelor's degree recipients' teaching status, by academic and teacher pipeline characteristics: 2003**

Academic and pipeline characteristics	Taught at some point			
	Total	Currently teaching	Not currently teaching	Never taught
Total	19.6	10.5	9.1	80.4
Attainment before 1992–93 bachelor's				
Associate's degree or less	19.1	10.4	8.8	80.9
Bachelor's degree or more	26.4	12.7	13.7	73.6
First postsecondary institution attended <sup>1</sup>				
Public 2-year	22.6	13.4	9.2	77.4
Public 4-year	19.2	10.9	8.3	80.9
Private not-for-profit 4-year	18.6	8.3	10.4	81.4
Bachelor's degree-granting institution				
Public non-doctorate-granting	26.6	17.4	9.2	73.4
Public doctorate-granting	17.4	8.7	8.7	82.6
Private not-for-profit non-doctorate-granting	19.7	10.7	9.1	80.3
Private not-for-profit doctorate-granting	16.9	6.0	10.9	83.1
Private for-profit 2-year-or-more	1.6	0.4	1.2	98.5
Baccalaureate degree major				
Business and management	4.7	2.3	2.4	95.3
Education	71.2	42.6	28.6	28.9
Health	8.2	2.4	5.8	91.8
Arts and humanities	28.1	12.7	15.3	71.9
Social/behavioral sciences	11.4	5.4	5.9	88.6
Science, mathematics, or engineering	10.4	4.8	5.6	89.6
Other	15.3	8.8	6.5	84.8
College entrance examination score <sup>2</sup>				
Lowest quarter	25.3	15.8	9.5	74.7
Middle two quarters	19.5	9.9	9.5	80.5
Highest quarter	14.3	5.7	8.6	85.7
Test scores not available	19.5	11.3	8.3	80.5
Normalized undergraduate GPA				
Less than 2.25	10.8	5.6	5.2	89.2
2.25–2.74	14.1	7.7	6.4	85.9
2.75–3.24	21.9	12.4	9.5	78.1
3.25–3.74	21.8	11.3	10.4	78.3
3.75 or higher	23.9	11.8	12.1	76.1

See notes at end of table.

**Table 2. Percentage distribution of 1992–93 bachelor's degree recipients' teaching status, by academic and teacher pipeline characteristics: 2003—Continued**

Academic and pipeline characteristics	Taught at some point			
	Total	Currently teaching	Not currently teaching	Never taught
<b>Highest degree attained</b>				
Bachelor's degree	16.1	8.1	8.0	83.9
Post-baccalaureate certificate	47.1	35.3	11.8	53.0
Master's degree	33.6	20.2	13.3	66.4
Post-master's certificate, doctorate, or first professional degree	10.2	2.0	8.2	89.8
<b>Teaching experience before 1992–93 bachelor's</b>				
Taught or trained	93.0	38.0	55.0	7.0
Neither taught nor trained	16.1	9.1	7.0	83.9
<b>Teacher pipeline status at 1994 interview</b>				
Was not considering teaching	3.5	1.9	1.6	96.5
Was considering	20.6	12.5	8.1	79.4
Had taught but not prepared	100.0	26.7	73.3	†
Had prepared but not taught	58.4	38.1	20.3	41.6
Had prepared and taught	100.0	58.5	41.5	†

† Not applicable.

<sup>1</sup> Included in the totals but not shown separately are data for respondents whose first institution was among the following categories: for-profit, less-than-2-year, or private not-for-profit 2-year.

<sup>2</sup> Derived from College Board-, institution-, or student-reported SAT or ACT scores, where available.

NOTE: Detail may not sum to totals because of rounding. Estimates include graduates from the 50 states, DC, and Puerto Rico.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

### ***Undergraduate Major Field of Study***

Some states have certification requirements that allow prospective teachers to complete the professional preparation and earn a teaching certificate as undergraduates, while in others, teachers' professional preparation may be partly reserved for post-baccalaureate study and practice. One policy goal of the latter type of certification requirement is to free up sufficient course time to allow future teachers to gain a thorough foundation in one or more academic disciplines (often an undergraduate major or minor), particularly in a subject matched or related to the one they intend as their primary teaching field.

Education majors were more likely than those who majored in any other set of disciplines to have gained some teaching experience by the time of the 2003 interview (table 2).

Approximately 71 percent of education majors among 1992–93 graduates had taught by 2003: 43 percent were currently teaching, and 29 percent had taught but were not teaching at the time of

the interview. As shown in figure 3, arts and humanities majors were the next most likely group: 28 percent of them had teaching experience by 2003, as did 15 percent of graduates who had majored in “other” fields (those not specified in another category). From 8–11 percent of graduates who had majored in the health professions; science, mathematics, or engineering; or social sciences had taught at some point by 2003. Five percent of business and management majors had taught by 2003.

Although it is no surprise that most education majors became teachers, 29 percent of education majors had *not* taught any of grades K–12 within 10 years of completing their bachelor’s degree. This group did not hold any teaching job, regardless of whether they completed student teaching and all other steps required for certification. (In fact, as discussed in the section below on teacher pipeline entry and progress, nearly all who completed preparation did teach at some point.) Larger proportions of graduates with other majors had no teaching experience, of course: 72 percent of arts or humanities majors, along with at least 85 percent of graduates who majored in each of the other five field categories.

Notably, a total of 57 percent of all education majors were not teaching in 2003—29 percent who had never taught plus 29 percent who were former teachers.<sup>6</sup> A considerable proportion of education majors in the B&B:93/03 sample did not complete the steps generally required (beyond a bachelor’s degree) for teaching, at least for teaching in public schools. As described in the section on preparation for teaching, once they completed all the preparation steps, graduates were extremely likely to then become teachers.

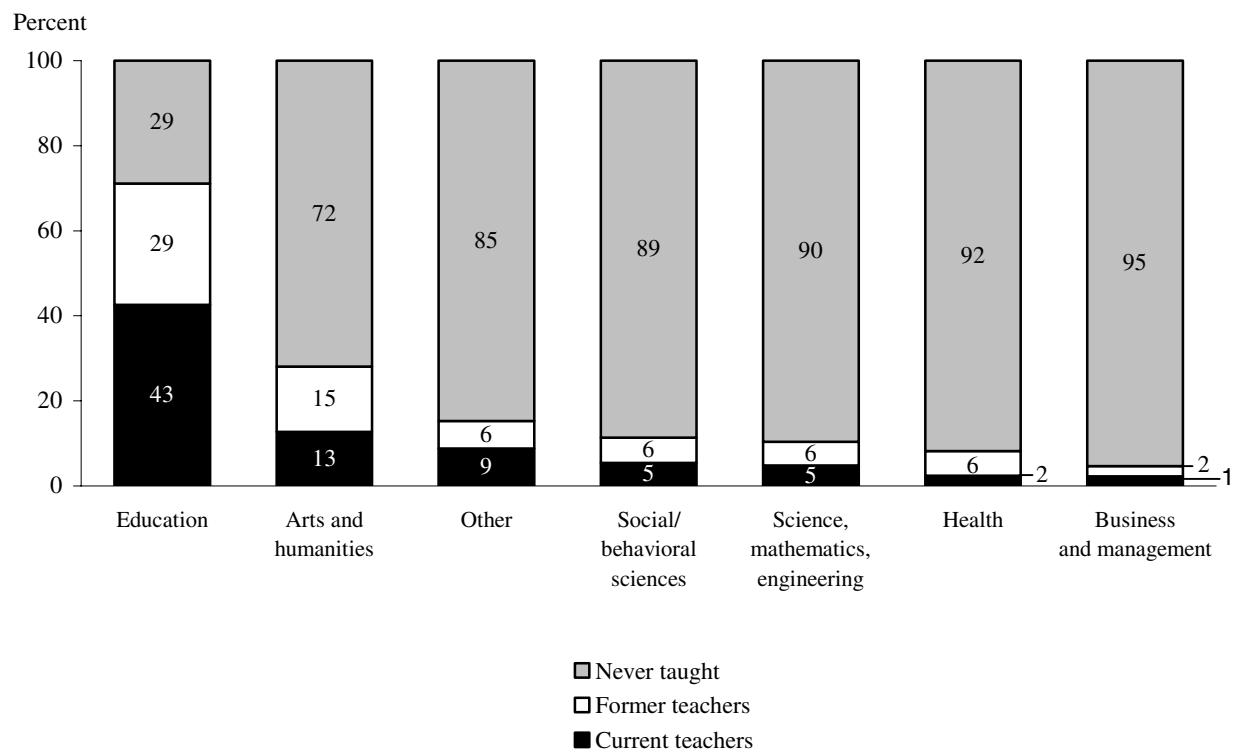
Only among education majors was the proportion of graduates who were teaching in 2003 greater than the proportion of graduates who had taught only in the past (table 2). For example, 5 percent of science, mathematics, or engineering majors were teaching in 2003, and 6 percent had taught but were no longer teaching in 2003. Among graduates who majored in other fields, including arts and humanities, health, and social or behavioral science, the proportion of teachers who had left teaching by 2003 was not measurably different from the proportion who were currently teaching in 2003. These findings suggest lower attrition rates from teaching among education majors than among majors in other fields.

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<sup>6</sup> Although the two estimates each round to 29 and thus their sum would appear to be 58, summing the unrounded estimates produces 57.4.

**Figure 3. Percentage distribution of 1992–93 bachelor's degree recipients' teaching status and experience, by baccalaureate degree major category: 2003**

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NOTE: Detail may not sum to totals because of rounding. Estimates include graduates from the 50 states, DC, and Puerto Rico.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

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### ***College Entrance Examination Scores***

In their efforts to improve student achievement, experts and policymakers have called for improvements in teachers' training and investigated ways to attract more high-achieving college graduates to teaching (Holmes Group 1986; NCTAF 2003; National Commission on Excellence in Education 1983). Some research has found that teachers with stronger academic skills, and in particular verbal ability, are more effective at teaching (Ehrenberg and Brewer 1995; Wayne and Youngs 2003).

In the absence of a standardized achievement test commonly taken by all college graduates, college applicants' scores on college entrance examinations, also called CEE scores (i.e., the Scholastic Aptitude Test or American College Testing test [SAT or ACT]), are sometimes used to measure the academic skills of teachers and compare them with other graduates' skills.

Because CEEs are taken mostly before applying to college, the scores have the drawback of failing to capture skills gained while earning the bachelor's degree and from any subsequent postsecondary education or labor force experience. An advantage of these scores, however, is that they provide an objective measure of performance on a scale common to all test takers, albeit prior to college.

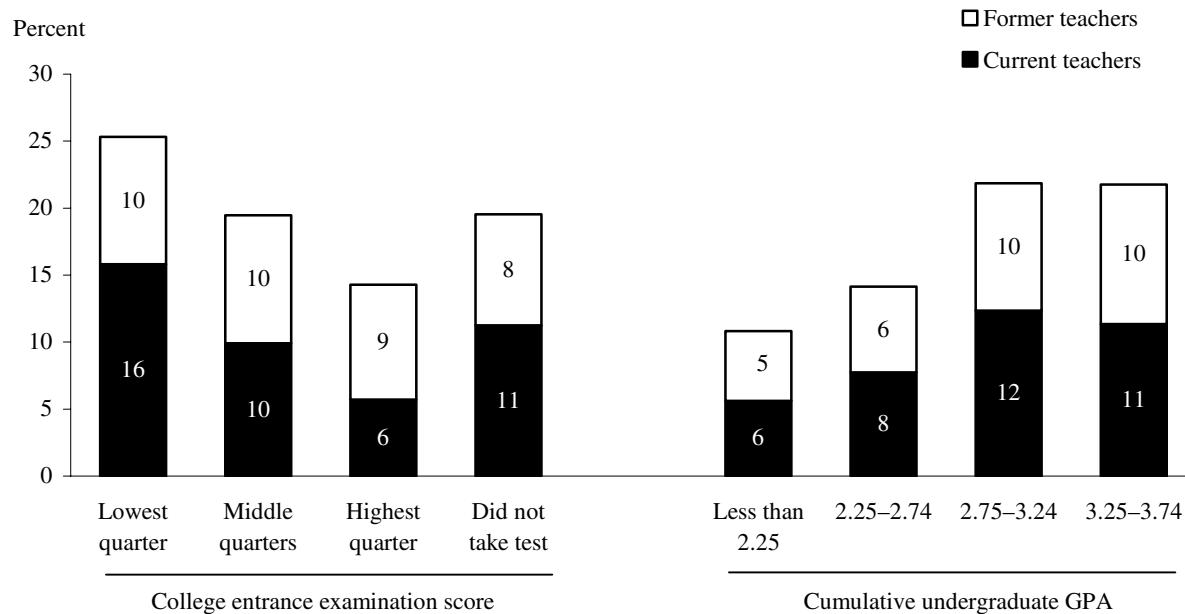
Research in the last couple of decades has found that teachers tend to have lower CEE or cognitive test scores than college graduates who entered other professions (Henke et al. 2005; Murnane et al. 1991; Schlechty and Vance 1983; Weaver 1983). Another analysis included selectivity of college as well as test scores and concluded that college graduates who became teachers had somewhat weaker academic backgrounds than their peers who entered other professions (National Science Board 2006). However, teachers in elementary schools have lower scores than those in high (or combined) schools, on average (Henke, Geis, and Giambattista 1996). In addition, high school teachers are more likely to hold master's degrees than elementary school teachers (Lewis et al. 1999). Thus, the general finding about lower skills and achievement among teachers versus other professionals may be an oversimplification that does not apply, or applies to a lesser degree, to high school teachers (see also Guarino, Santibanez, and Daley 2006). Consistent with prior findings for graduates in different professions, 16 percent of 1992–93 graduates with CEE scores in the lowest 25 percent of the distribution were teaching in 2003, compared with 10 percent of those in the middle half of the score distribution and 6 percent of those with the highest scores (figure 4 and table 2). The likelihood that a bachelor's degree recipient had never taught also increased from 75 percent in the low-score group to 86 percent in the high-score group.

### ***Grade Point Average in College***

A second measure of teachers' academic qualifications is their grade point average (GPA) in college courses. This measure has the advantages of being closer in time to their teaching jobs (than CEE scores) and reflecting skills gained in college. The weakness of course grades, however, is that they are assigned without reference to an objective standard, either within or among institutions. Similar student performance could receive different grades from different professors and even courses classified as similar can have widely varying content. Grades also vary by major field of study, which is itself related to the likelihood of pursuing teaching, as described above (Henke, Geis, and Giambattista 1996). In contrast to their CEE scores, teachers generally have similar or higher average grades than other college graduates (Book, Freeman, and Brousseau 1985; Frankel and Stowe 1990; Gray et al. 1993; Henke, Geis, and Giambattista 1996).

**Figure 4. Percentage of 1992–93 bachelor's degree recipients who were current or former teachers, by college entrance examination score and normalized undergraduate GPA: 2003**

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NOTE: Estimates include graduates from the 50 states, DC, and Puerto Rico.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

Consistent with these earlier findings, the grades that graduates in this cohort earned while in college also bore a positive relationship to their likelihood of teaching in 2003 (in contrast to CEE scores, which had an inverse relationship). As college GPA increased, graduates were more likely to be teachers (figure 4 and table 2). For example, while 6 percent of graduates whose GPA was lower than 2.25 were currently teaching, 11–12 percent of those with GPAs of 2.75 or higher were teaching. The proportion who had taught only in the past also increased as GPA reached higher levels, while the proportion who had never taught decreased.

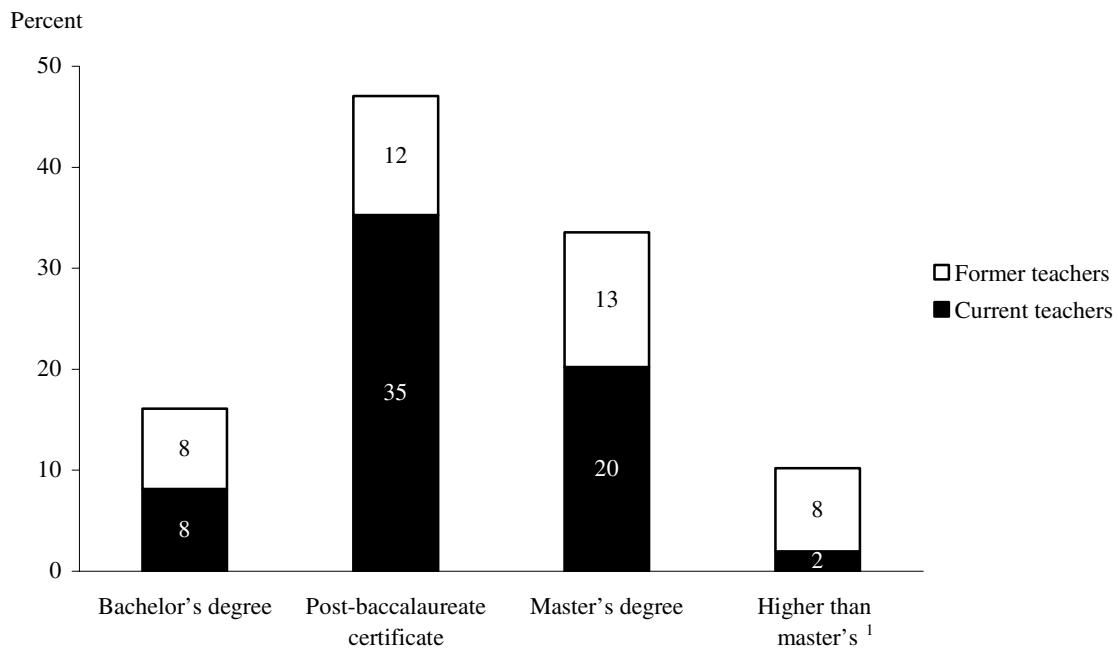
### ***Highest Degree Attained***

In nearly every school district, salary schedules are based on teachers' years of service and accumulated education, measured either as degrees attained or postsecondary credits earned, or a combination of the two. Approximately one-half of teachers had master's degrees in 2002 (U.S.

Department of Education 2004). (The same source indicates that master's degrees in education account for 28 percent of all master's degrees conferred.)

Among 1992–93 graduates whose highest earned degree by 2003 was a master's, 34 percent had taught at some point by 2003, along with 47 percent of those who had attained a post-baccalaureate certificate (figure 5 and table 2). In contrast, 16 percent of graduates who did not go beyond a bachelor's and 10 percent of those who earned a credential more advanced than a master's degree had taught by 2003. Approximately 1 in 3 graduates (35 percent) with post-baccalaureate certificates held teaching jobs when interviewed in 2003.

**Figure 5. Percentage of 1992–93 bachelor's degree recipients who were current or former teachers in 2003, by highest degree attained by 2003**



<sup>1</sup> Credentials include post-master's certificates, doctorates, and first-professional degrees.

NOTE: School characteristics apply to respondents' current or most recent teaching job. Estimates include graduates from the 50 states, DC, and Puerto Rico.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

## Teachers' Job Characteristics and Opinions About Teaching

Overall, 20 percent of 1992–93 college graduates had taught at some point before the 2003 interview, 10 years after college completion (table 2). This section describes this group by examining several characteristics of the schools in which they taught and of their teaching

positions, followed by a look at the teachers' attitudes, including satisfaction with teaching and plans for the future.

### ***Characteristics of Current or Most Recent Teaching Job***

Teachers with certain characteristics are more likely to leave the profession, a recent literature review found (Guarino, Santibanez, and Daley 2006). Teachers who are White, female, new to teaching, or near retirement age tend to be more likely to leave teaching than other teachers. The same is true for those who have higher test scores or teach mathematics or science.

The first part of this section looks at whether current teachers differed from those who had left teaching by 2003 on a range of job and school characteristics. For former teachers, the characteristics apply to their most recent teaching job. Table 3 shows the percentage distributions of current and former teachers by various characteristics of the schools in which they taught and their teaching jobs. (Categories sum to 100 vertically for each characteristic.) Graduates who were teaching in 2003 were more likely than graduates who were former teachers to work at a public school. Among graduates who were teaching in 2003, 91 percent were teaching in a public school, compared with 79 percent of former teachers whose most recent teaching job had been in a public school (figure 6).

Nearly two-thirds (64 percent) of current teachers worked in elementary schools, versus 30 percent at secondary schools. However, the ratio of elementary to secondary school teachers was greater among current teachers than former teachers, suggesting that secondary school teachers left teaching at higher rates. This finding appears consistent with elementary school teachers' greater tendency (compared to secondary teachers) to plan to stay in the profession until retirement, discussed in the section on future career plans.

On other characteristics, differences were generally not found between current and former teachers. For both groups, between 30 and 35 percent taught in a central city, and 35–39 percent taught in urban fringe (suburban) areas or large towns, with the remainder teaching in small towns or rural areas. In addition, 17–18 percent of each group were or had been teaching at schools with less than 5 percent minority enrollment, and 29–31 percent were at schools with 50 percent or more minority students.

About 35 percent of current teachers reported their main assignment field as general elementary, and 18 percent taught science or mathematics (figure 7). Each of the other main assignment fields accounted for 11 percent or less of the distribution by main field. Significant differences were not found between the proportions of current and former teachers in the various

**Table 3. Among 1992–93 bachelor's degree recipients who were current or former teachers, percentage distributions by characteristics of current or most recent school and teaching job: 2003**

School and job characteristics	Teaching status in 2003	
	Currently teaching	Not currently teaching
Total	100	100
Sector		
Public	90.6	78.7
Private	9.4	21.3
Level <sup>1</sup>		
Elementary	63.8	51.7
Secondary	30.1	36.3
Combined	6.2	12.0
Percent minority enrollment		
0–4	17.4	18.3
5–19	24.8	24.6
20–49	28.4	25.7
50 or more	29.4	31.4
Percent free or reduced-price lunch recipients		
0–4	12.6	7.9
5–19	27.8	31.3
20–49	36.0	34.1
50 or more	23.6	26.7
Community type		
Central city	30.3	35.3
Urban fringe/large town	39.0	35.3
Small town/rural	30.7	29.4
Main teaching field		
General elementary	35.4	29.9
Business and vocational	1.7	6.1
Science or mathematics	18.1	16.4
Foreign languages	2.6	4.9
Special/ESL/bilingual education	11.0	10.8
English	10.8	10.1
Social studies	6.3	6.0
Fine arts	3.7	4.2
Other	10.6	11.7

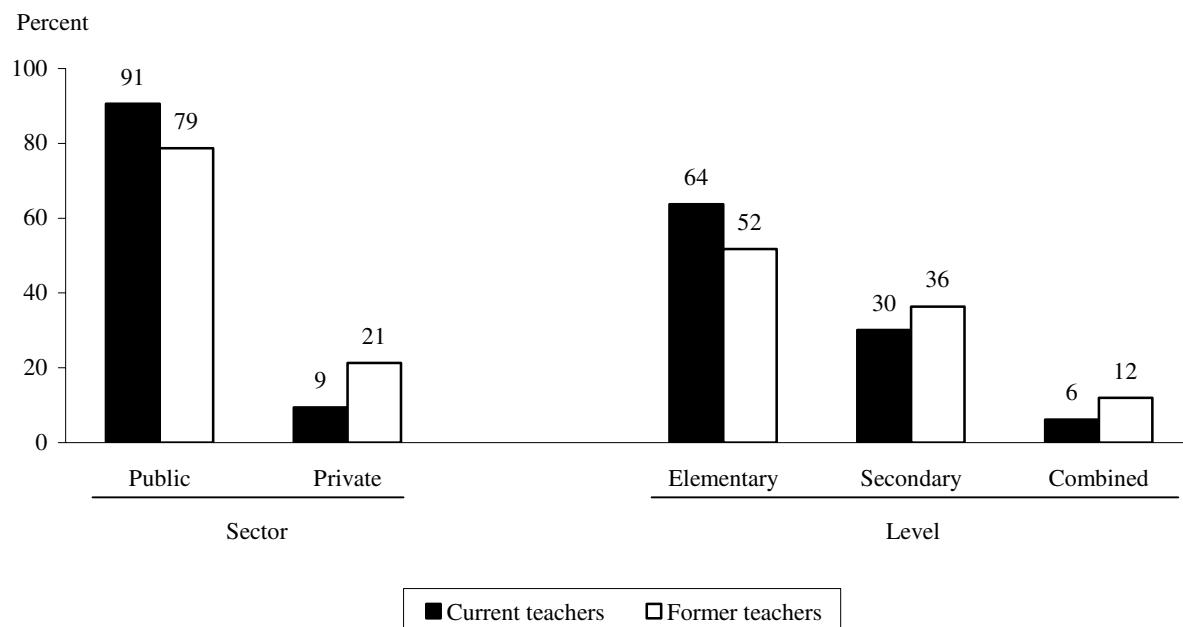
<sup>1</sup> Elementary schools provide instruction in some grade lower than 7th and no grade higher than 8th. Secondary schools provide instruction in no grade lower than 7th. Combined schools provide instruction in some grade lower than 7th and some grade higher than 8th. Included in the totals but not shown separately are data for respondents who taught at combined schools.

NOTE: Detail may not sum to totals because of rounding. Estimates include graduates from the 50 states, DC, and Puerto Rico.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

**Figure 6. Among 1992–93 bachelor's degree recipients who were current or former teachers, percentage distributions by school sector and level: 2003**

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NOTE: School characteristics apply to respondents' current or most recent teaching job. Detail may not sum to totals because of rounding. Estimates include graduates from the 50 states, DC, and Puerto Rico.

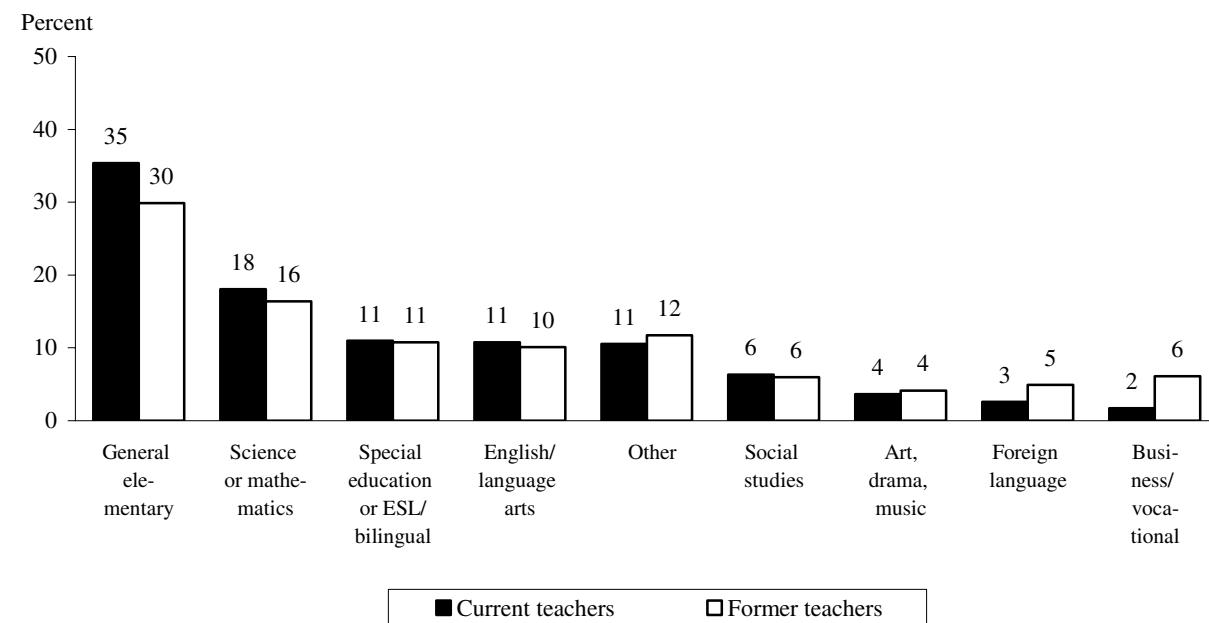
SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

main assignment fields, with one exception: 6 percent of former teachers taught mainly business/vocational courses, compared with 2 percent of current teachers.

### ***Job Satisfaction and Plans for Continuing to Teach***

Reducing the number of teachers who leave the profession before retirement is one way to raise average teacher experience and decrease the chances that any particular student will have an inexperienced teacher. As a group, new teachers, particularly those in their first year, tend to be less effective than teachers with more time on the job (Hanushek et al. 2005; Rowan, Correnti, and Miller 2002; Greenwald, Hedges, and Laine 1996). Although teacher retention has attracted much concern, it should be noted that bachelor's degree-holding teachers are less likely than many other graduates to leave their initial occupation, even in the first few years. For example, a wide range, between 17 and 75 percent, of 1992–93 college graduates changed occupations within 4 years of receiving their bachelor's degrees, when grouped by occupation held at the 1-year point (Henke and Zahn 2001). Teachers were among the least likely to

**Figure 7. Among 1992–93 bachelor's degree recipients who were current or former teachers, percentage distributions by main teaching field: 2003**



NOTE: Detail may not sum to totals because of rounding. Estimates include graduates from the 50 states, DC, and Puerto Rico.

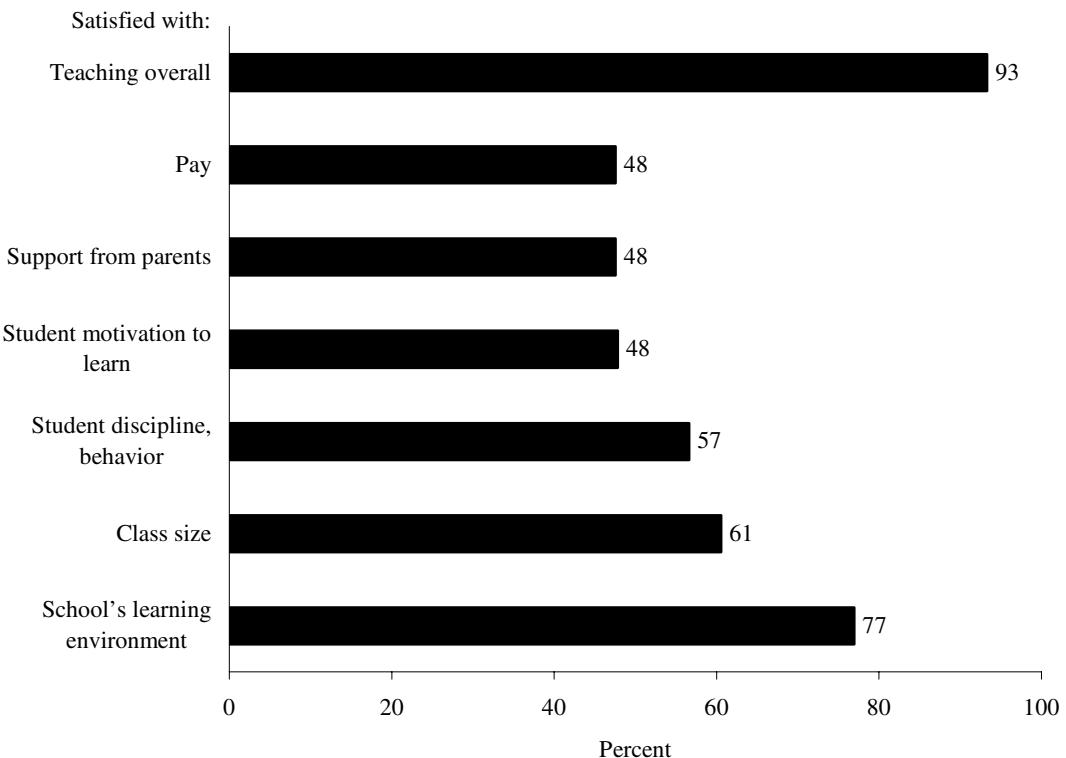
SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

change occupations in this time period, at 18 percent. Nevertheless, as policymakers and administrators seek to improve planning for future staffing and to increase teacher retention, they may seek data about teachers' job satisfaction and career plans. This section briefly discusses the data on these topics from the 1993–2003 cohort.

Graduates who were teaching in 2003 were asked whether they were satisfied with teaching overall and with specific aspects of the job; the results are shown in figure 8. Nearly all teachers expressed satisfaction with teaching overall in 2003 (93 percent). Teachers were more likely to be satisfied with the job overall than with any of the six specific school or job characteristics shown. They were also more satisfied with some aspects of teaching than others. For example, 77 percent said they were satisfied with the learning environment at their current school, while 48 percent expressed satisfaction with parent support, with students' motivation to learn, and with pay. Roughly 3 out of 5 teachers were satisfied with class sizes (61 percent) and with student discipline and behavior at their school (57 percent).

**Figure 8. Among 1992–93 bachelor's degree recipients who were teaching in 2003, percentages who were satisfied with teaching overall and with various aspects of teaching: 2003**

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NOTE: School and job characteristics apply to respondents' current teaching job. Estimates include graduates from the 50 states, DC, and Puerto Rico.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

Among current teachers in 2003, nearly all reported that they would choose teaching again (90 percent), and two-thirds (67 percent) said they would remain in teaching for the rest of their working life (table 4). Relatively few teachers said they would leave before retirement for a non-teaching job in education or for a better job (8 and 10 percent, respectively). On the measure of how long they expected to stay in teaching, elementary school teachers were more inclined to say until retirement than secondary school teachers (71 vs. 59 percent, respectively).

**Table 4. Among 1992–93 bachelor's degree recipients who were teaching in 2003, percentage distribution of length of time they expected to stay in teaching, and percentage who would choose teaching again, by demographic, academic, and teaching job characteristics: 2003**

Demographic, academic, and job characteristics <sup>1</sup>	Length of time expect to stay in teaching				Would choose teaching again
	Rest of working life	Until non-teaching job in education comes along	Until something better comes along	Other	
Total	67.0	7.6	10.4	15.1	89.7
Gender					
Male	64.8	11.0	13.4	10.8	94.1
Female	67.7	6.5	9.4	16.5	88.3
Race/ethnicity <sup>2</sup>					
White	70.0	6.7	9.4	14.0	89.6
Black	37.0	18.9	20.0	24.2	82.1
Hispanic	64.7	4.0	11.2	20.1	99.3
College entrance exam scores <sup>3</sup>					
Lowest quarter	69.8	6.2	9.7	14.3	89.9
Middle two quarters	68.3	9.0	9.1	13.6	90.8
Highest quarter	57.9	5.4	20.3	16.5	89.6
Test scores not available	64.2	7.4	9.9	18.5	87.6
Baccalaureate degree major <sup>4</sup>					
Education	71.1	6.0	9.3	13.6	87.6
Arts and humanities	66.8	10.5	6.8	15.9	90.8
Social/behavioral sciences	55.9	5.6	14.9	23.7	88.7
Science, mathematics, or engineering	66.9	4.4	12.5	16.3	93.9
Other	61.2	12.0	12.6	14.2	95.4
Normalized undergraduate GPA <sup>5</sup>					
2.25–2.74	61.3	7.1	11.7	19.9	89.7
2.75–3.24	67.2	8.3	9.7	14.8	91.1
3.25–3.74	65.6	8.4	11.7	14.3	89.0
3.75 or higher	73.7	5.4	9.1	11.7	86.9
Bachelor's degree-granting institution <sup>6</sup>					
Public non-doctorate-granting	69.1	6.3	11.6	13.0	89.3
Public doctorate-granting	64.8	9.6	10.3	15.3	89.2
Private not-for-profit non-doctorate-granting	63.8	7.3	11.7	17.3	91.4
Private not-for-profit doctorate-granting	71.7	5.5	2.2	20.6	91.1

See notes at end of table.

**Table 4. Among 1992–93 bachelor's degree recipients who were teaching in 2003, percentage distribution of length of time they expected to stay in teaching, and percentage who would choose teaching again, by demographic, academic, and teaching job characteristics: 2003—Continued**

Demographic, academic, and job characteristics <sup>1</sup>	Length of time expect to stay in teaching				Would choose teaching again
	Rest of working life	Until non-teaching job in education comes along	Until something better comes along	Other	
<b>Highest degree attained<sup>7</sup></b>					
Bachelor's degree	68.0	6.6	10.3	15.1	88.2
Master's degree	65.5	9.2	10.3	15.0	91.9
<b>Sector</b>					
Public	66.6	8.0	10.1	15.4	89.9
Private	71.2	3.5	13.3	12.1	88.2
<b>Level<sup>8</sup></b>					
Elementary	70.9	7.0	8.2	13.9	89.4
Secondary	59.2	8.6	14.5	17.7	91.1
Combined	65.0	8.4	12.2	14.4	87.1
<b>Percent minority enrollment</b>					
0–4	71.2	4.6	9.2	15.0	89.9
5–19	70.2	5.6	10.3	13.9	91.5
20–49	65.3	8.9	9.8	16.0	89.7
50 or more	63.5	9.6	11.7	15.2	88.2
<b>Percent free or reduced-price lunch recipients</b>					
0–4	53.1	14.3	14.5	18.1	94.8
5–19	67.6	5.5	9.5	17.4	91.1
20–49	72.5	6.5	8.7	12.3	88.7
50 or more	63.1	9.9	10.7	16.4	87.6
<b>Employment status</b>					
Full-time	67.7	7.5	9.9	14.9	89.9
Part-time	59.2	8.5	17.5	14.8	89.7
<b>Main teaching field<sup>9</sup></b>					
General elementary	76.2	4.0	7.7	12.1	87.7
Science or mathematics	67.6	9.1	8.9	14.4	93.1
Special/ESL/bilingual education	58.8	10.6	14.4	16.3	88.4
English	60.3	9.0	14.0	16.7	89.9
Social studies	72.0	10.8	7.7	9.5	90.6
Art, drama, or music	59.9	2.4	12.5	25.2	95.2
Other	59.9	8.5	11.8	19.7	87.5

See notes at end of table.

**Table 4. Among 1992–93 bachelor's degree recipients who were teaching in 2003, percentage distribution of length of time they expected to stay in teaching, and percentage who would choose teaching again, by demographic, academic, and teaching job characteristics: 2003—Continued**

Demographic, academic, and job characteristics <sup>1</sup>	Length of time expect to stay in teaching				Would choose teaching again
	Rest of working life	Until non-teaching job in education comes along	Until something better comes along	Other	
<b>Satisfied with teaching overall</b>					
Yes	68.9	7.6	9.0	14.4	91.6
No	39.9	6.4	29.4	24.2	62.5

<sup>1</sup> School and job characteristics apply to current school and teaching job.

<sup>2</sup> Black includes African American and Hispanic includes Latino. Race categories exclude Hispanic origin. Included in the totals but not shown separately are data for respondents who identified themselves as American Indian/Alaska Native, Asian/Pacific Islander, or another race.

<sup>3</sup> Derived from College Board-, institution-, or student-reported SAT or ACT scores, where available.

<sup>4</sup> Included in the totals but not shown separately are data for respondents who majored in business or management and health fields.

<sup>5</sup> Included in the totals but not shown separately are data for respondents whose undergraduate GPA was less than 2.25.

<sup>6</sup> Included in the totals but not shown separately are data for respondents who attended private for-profit 2-year-or-more institutions.

<sup>7</sup> Included in the totals but not shown separately are data for respondents who attained postbaccalaureate certificates or degrees higher than master's.

<sup>8</sup> Elementary schools provide instruction in some grade lower than 7th and no grade higher than 8th. Secondary schools provide instruction in no grade lower than 7th. Combined schools provide instruction in some grade lower than 7th and some grade higher than 8th. Included in the totals but not shown separately are data for respondents who taught at combined schools.

<sup>9</sup> Included in the totals but not shown separately are data for respondents whose main teaching field was business and vocational, and foreign languages.

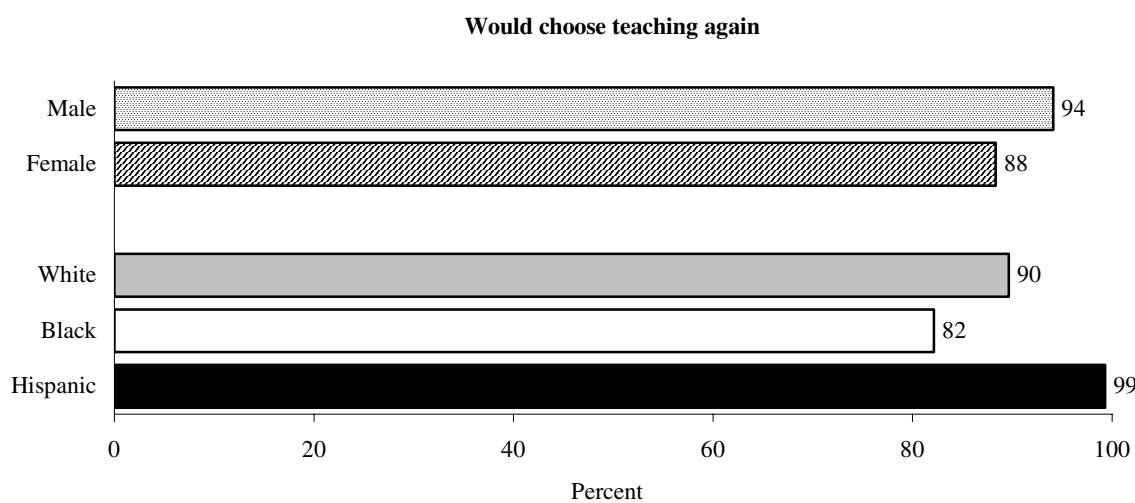
NOTE: Detail may not sum to totals because of rounding. Estimates include graduates from the 50 states, DC, and Puerto Rico.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

Male and female teachers did not differ measurably in how long they planned to remain in the profession. However, more male than female teachers (94 vs. 88 percent) said they would choose teaching if they had a chance to make the decision again (figure 9). In addition, White teachers were more likely than Black teachers to plan to teach until retirement (70 vs. 37 percent; figure 10). White, Black, and Hispanic teachers were not measurably different on these indicators of plans to remain and satisfaction with teaching, except that Hispanic teachers were more likely than White teachers to say they would choose teaching again (99 vs. 90 percent).

**Figure 9.** Among 1992–93 bachelor's degree recipients who were teaching in 2003, percentage who would choose teaching again, by gender and race/ethnicity: 2003

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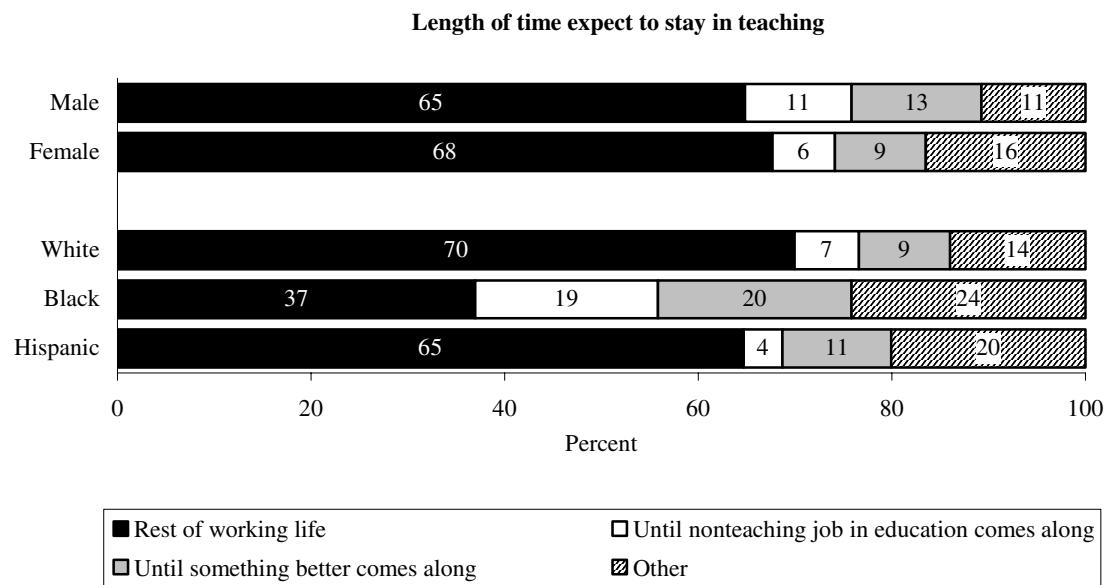
NOTE: Black includes African American and Hispanic includes Latino. Race categories exclude Hispanic origin. Estimates include graduates from the 50 states, DC, and Puerto Rico.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

### ***Reasons for Not Teaching in 2003***

About 11 percent of the 1992–93 cohort were teaching in 2003, and 9 percent had taught but were not currently teaching (table 2). Evidence did not indicate that these two estimates differed; therefore, roughly as many graduates of the 1992–93 cohort had left teaching as stayed in the field by 2003, whether they had left on a temporary or permanent basis. (Some of the teachers not teaching in 2003 may return to teaching at some point in the future, while others had left the profession for good.) Figure 11 and table 5 present estimates for the percentage of former teachers who gave various main reasons for not teaching in 2003. Between 13 and 22 percent of the total group cited one or more of the top five reasons: “other” (an unspecified reason); family-related, such as raising children; to work outside of education; to take a nonteaching job within the education field; and low pay. Evidence was not found for differences in the percentages citing one versus another of these reasons. Seven percent reported difficulty with students, parents, or administrators; additional reasons were each selected by 3 percent or fewer of respondents.

**Figure 10. Among 1992–93 bachelor's degree recipients who were teaching in 2003, percentage distributions by length of time they expected to stay in teaching, by gender and race/ethnicity: 2003**



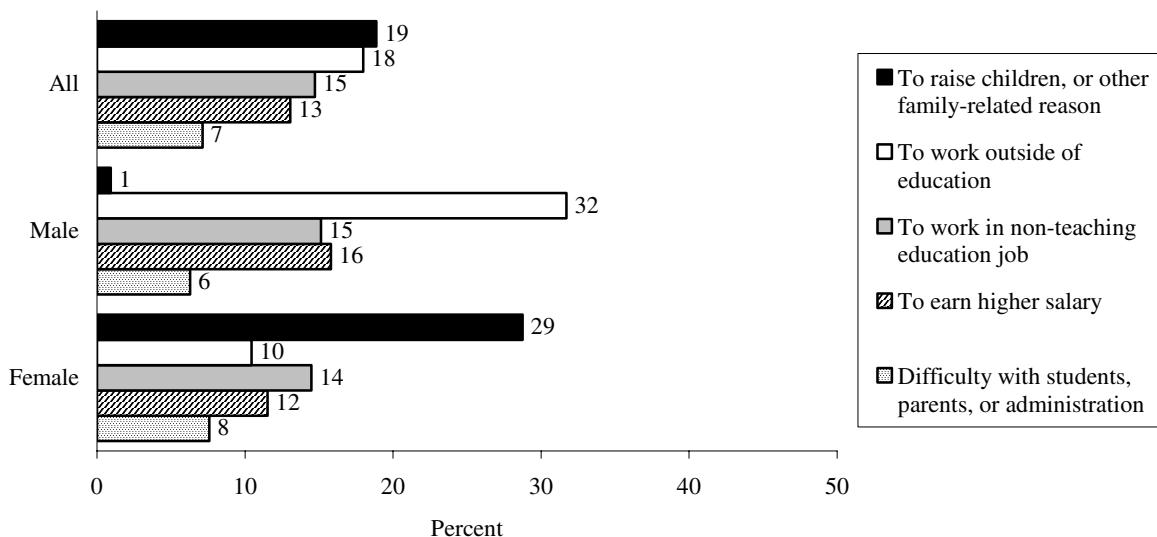
NOTE: Black includes African American and Hispanic includes Latino. Race categories exclude Hispanic origin. Detail may not sum to totals because of rounding. Estimates include graduates from the 50 states, DC, and Puerto Rico.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

The frequency of certain main reasons for leaving teaching differed by gender. Male teachers were three times as likely as their female counterparts to leave for a job outside of education (32 vs. 10 percent), while women were about 30 times as likely as men to leave for family-related reasons such as raising children (29 vs. 1 percent). However, gender differences were not detected for the percentages who left teaching to seek higher pay elsewhere or to take a non-teaching job in the education field. Former elementary school teachers gave family-related reasons at a higher rate (26 percent) than former secondary school teachers (11 percent) or teachers at combined schools (14 percent).

**Figure 11. Of 1992–93 bachelor's degree recipients who had taught but were not teaching in 2003, percentage who cited certain main reasons for not teaching, by gender: 2003**

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NOTE: Estimates include graduates from the 50 states, DC, and Puerto Rico.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

**Table 5. Among 1992–93 bachelor's degree recipients who had taught but were not teaching in 2003, percentage distribution of their main reason for leaving, by demographic, academic, and teaching job characteristics: 2003**

Demographic, academic, and teaching job characteristics	Main reason not teaching in 2003									
	To raise a family or other family-related reasons	To work outside of education	To change to non-teaching job in education	Low pay	Difficulty with students, parents, or administration	Laid off or work-force reduction	Relocated	Health reasons	To take a sabbatical or break from teaching	Other
Total	18.9	18.0	14.7	13.1	7.1	2.6	2.5	0.9	0.5	21.7
Gender										
Male	0.9	31.7	15.1	15.8	6.3	0.6	3.8	1.6	1.5	22.7
Female	28.7	10.5	14.5	11.5	7.6	3.8	1.8	0.6	#	21.1
College entrance exam scores										
Lowest quarter	23.0	10.0	19.5	18.5	7.4	5.3	3.4	#	#	12.9
Middle two quarters	23.5	17.7	16.0	11.6	7.3	1.2	1.2	0.6	0.5	20.5
Highest quarter	13.6	25.8	11.0	17.3	7.2	2.1	1.3	1.4	1.4	18.9
Test scores not available	7.2	19.2	9.9	6.6	6.1	4.4	6.6	2.5	#	37.6
Baccalaureate degree major <sup>1</sup>										
Education	32.1	6.7	19.1	14.1	9.4	1.7	1.8	0.3	#	14.8
Arts and humanities	10.1	21.9	6.5	11.6	11.7	#	7.5	1.3	1.2	28.3
Social/behavioral sciences	12.8	18.3	3.9	9.3	#	10.7	#	3.3	#	41.7
Science, mathematics, or engineering	2.9	44.5	7.5	14.6	5.1	3.6	#	#	#	21.8
Other	20.8	18.9	20.3	13.8	2.1	7.1	2.3	2.5	#	12.3
Normalized undergraduate GPA										
2.25–2.74	11.0	22.0	13.1	23.2	8.8	1.2	1.6	1.6	#	17.4
2.75–3.24	25.1	18.6	15.0	9.5	7.4	0.4	1.5	#	1.7	20.7
3.25–3.74	22.6	18.0	14.5	11.9	7.4	1.8	1.2	2.3	#	20.4
3.75 or higher	15.1	8.1	15.7	15.3	5.0	10.8	8.7	#	#	21.3

See notes at end of table.

**Table 5. Among 1992–93 bachelor's degree recipients who had taught but were not teaching in 2003, percentage distribution of their main reason for leaving, by demographic, academic, and teaching job characteristics: 2003—Continued**

Demographic, academic, and teaching job characteristics	Main reason not teaching in 2003									
	To raise a family or other family-related reasons	To work outside of education	To change to non-teaching job in education	Low pay	Difficulty with students, parents, or administration	Laid off or work-force reduction	Relocated	Health reasons	To take a sabbatical or break from teaching	Other
<b>Bachelor's degree-granting institution</b>										
Public non-doctorate-granting	19.5	4.5	19.9	7.5	11.5	1.0	3.1	2.9	#	30.1
Public doctorate-granting	22.2	17.3	14.6	15.9	6.1	4.8	0.7	#	1.1	17.2
Private not-for-profit non-doctorate-granting	9.9	21.3	14.5	14.1	4.4	#	1.6	0.8	#	33.4
Private not-for-profit doctorate-granting	16.3	28.5	10.7	11.3	6.3	1.0	9.6	1.9	#	14.5
<b>Highest degree attained</b>										
Bachelor's degree	22.6	16.9	8.8	10.8	8.7	2.0	3.4	#	0.4	26.3
Master's degree	14.7	17.9	21.6	19.4	4.8	3.7	1.4	2.0	0.8	13.7
<b>Preparation for teaching</b>										
Had taught but not prepared	5.6	24.5	11.2	7.6	3.2	3.3	4.2	0.7	0.7	39.2
Had prepared and taught	26.8	14.1	16.8	16.3	9.5	2.3	1.5	1.1	0.4	11.2
<b>Sector of school</b>										
Public	20.1	17.0	13.4	14.3	7.8	3.3	0.9	1.2	0.7	21.5
Private	14.5	21.5	19.6	8.5	4.8	#	8.7	#	#	22.3
<b>Level of school<sup>2</sup></b>										
Elementary	25.9	15.1	13.1	13.8	6.9	2.1	1.0	0.7	1.0	20.4
Secondary	10.7	22.3	17.9	13.0	8.2	4.1	3.8	1.5	#	18.6
Combined	13.7	16.9	11.4	10.0	4.9	#	5.2	#	#	38.0
Satisfied with teaching overall	5.0	18.3	18.8	18.4	9.0	3.6	1.7	1.0	0.9	23.4

See notes at end of table.

**Table 5. Among 1992–93 bachelor's degree recipients who had taught but were not teaching in 2003, percentage distribution of their main reason for leaving, by demographic, academic, and teaching job characteristics: 2003—Continued**

Demographic, academic, and teaching job characteristics	Main reason not teaching in 2003									
	To raise a family or other family-related reasons	To work outside of education	To change job in education	Difficulty with students, parents, or administration	Laid off or work-force reduction	Relocated	Health reasons	To take a sabbatical or break from teaching	Other	
<b>Percent minority enrollment</b>										
0–4	16.9	39.2	8.2	5.7	6.9	#	#	#	#	23.0
5–19	21.0	15.5	16.9	16.5	8.9	2.8	1.0	0.5	#	16.8
20–49	23.8	10.0	16.1	13.1	6.1	2.2	2.0	#	#	26.8
50 or more	15.1	12.4	16.3	15.2	6.9	4.4	5.4	2.5	1.5	20.3
<b>Percent free or reduced-price lunch recipients<sup>3</sup></b>										
5–19	15.3	32.3	11.8	12.1	7.2	3.0	#	#	#	18.4
20–49	22.9	11.0	15.9	10.7	6.4	6.3	0.8	2.6	1.0	22.4
50 or more	20.6	10.6	11.9	22.1	10.0	1.2	1.1	1.2	1.2	20.1
<b>Main teaching field<sup>4</sup></b>										
General elementary	38.9	9.0	15.4	8.4	6.8	2.7	0.5	1.8	#	16.5
Science or mathematics	10.4	25.7	25.9	15.9	8.5	#	#	2.3	#	11.3
Special/ESL/Bilingual education	24.4	10.1	24.2	7.9	7.4	4.7	#	#	#	21.4
English	20.2	14.8	15.4	23.2	7.3	#	#	#	#	19.2
Other	3.0	11.3	21.2	18.9	3.2	#	3.5	2.4	4.1	32.5

# Rounds to zero.

<sup>1</sup> Included in the totals but not shown separately are data for respondents who majored in business or health fields.

<sup>2</sup> Elementary schools provide instruction in some grade lower than 7th and no grade higher than 8th. Secondary schools provide instruction in no grade lower than 7th.

Combined schools provide instruction in some grade lower than 7th and some grade higher than 8th. Included in the totals but not shown separately are data for respondents who taught at combined schools.

<sup>3</sup> Included in the totals but not shown separately are data for respondents whose school had 0–4 percent free or reduced-price lunch recipients.

<sup>4</sup> Included in the totals but not shown separately are data for respondents with main field of business/vocational, foreign language, social studies, or fine arts.

NOTE: School and job characteristics apply to most recent school and teaching job. Detail may not sum to totals because of rounding. Estimates include graduates from the 50 states, DC, and Puerto Rico.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

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## **Preparation for Teaching**

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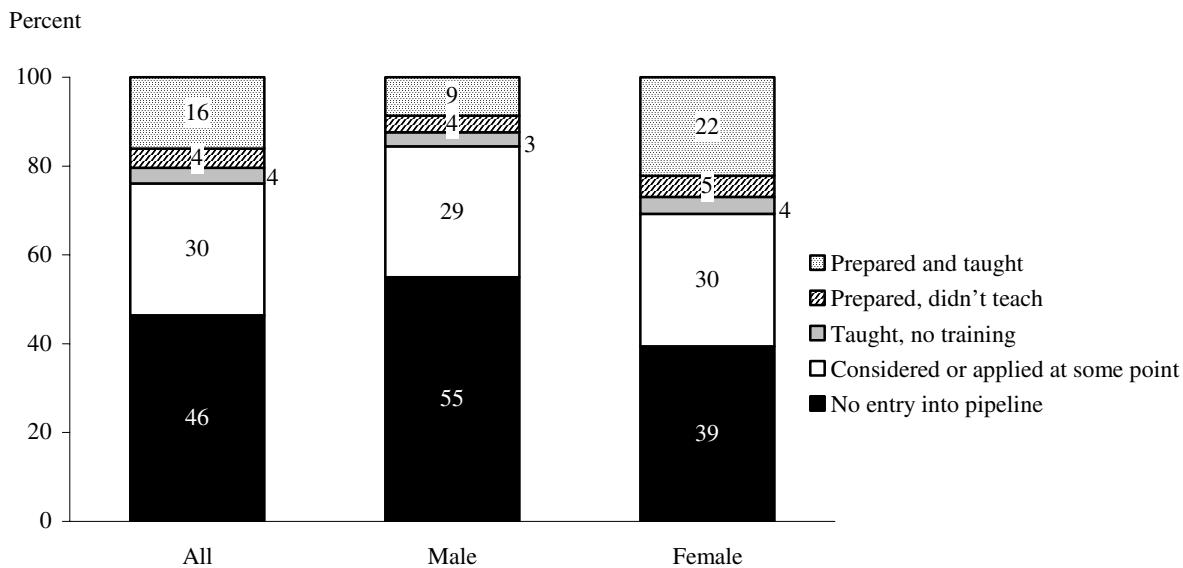
Researchers and policymakers are interested in teacher preparation for several reasons, perhaps foremost to ensure that teachers are adequately trained to face the challenges of teaching. Educational leaders seek to attract highly skilled college graduates to teaching and to provide useful training and practice likely to transform them into effective teachers. Preparation and certification requirements have been changed by state agencies in recent years, with the aim of ensuring that all teachers have specific kinds of preparation; at the same time, policymakers want to avoid inadvertently creating barriers that prevent skilled people from becoming teachers. In addition, strong preservice preparation and individualized support for novice teachers are critical not only to teachers' effectiveness but also to retaining them in the profession beyond the first few years (Smith and Ingersoll 2004; NCTAF 1997). Districts sometimes have difficulty finding and hiring well-trained teachers, especially in fields like mathematics, science, and special education (Murphy, DeArmond, and Guin 2003; National Governors Association 2000; NCTAF 2003). One highly effective way to address the scarcity of teachers is to reduce the attrition that occurs among new teachers (Cochran-Smith 2004; Ingersoll 2001, 2004; Wayne 2000; Guarino, Santibanez, and Daley 2006). This section sheds some light on these issues by presenting information on the characteristics of 1992–93 college graduates who entered and progressed through—or avoided—the teacher pipeline in the subsequent decade.

### **Progress Through the Teacher Pipeline**

The various stages of preparation and teaching experience can be viewed as a pipeline, in which the entire sample is eligible for the first stage but each successive stage requires having taken certain steps toward teaching (categories are shown in figure 12 and table 6). In this categorization, the subset of college graduates who never considered teaching appear in the first category: no pipeline entry. Those who considered teaching or applied for a teaching job at some point in the 10-year follow-up period, but took no further steps to prepare, make up the second category. The third category consists of those who did not prepare but nevertheless did some teaching. The fourth category encompasses graduates who prepared to teach but did no teaching. The fifth and final category consists of prepared teachers—those who completed all steps for preparation and had some teaching experience (though were not necessarily current teachers in 2003).

**Figure 12. Percentage distributions of 1992–93 bachelor’s degree recipients by status in the teacher pipeline, by gender: 2003**

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NOTE: Detail may not sum to totals because of rounding. Estimates include graduates from the 50 states, DC, and Puerto Rico.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

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Nearly one-half (46 percent) of 1992–93 bachelor’s degree recipients reported they had neither considered teaching nor taken any steps to prepare for the profession—that is, they had not entered the teacher pipeline (figure 12 and table 6). Another 30 percent had either considered teaching or applied for a teaching job at some point—but went no farther than this first stage in the pipeline. Roughly 4 percent each had taught with no training or prepared but not taught, and 16 percent overall had both prepared to teach and taught.

### ***Becoming a Prepared Teacher***

Graduates count as “prepared to teach” in this report if they completed a student teaching assignment or earned a teaching certificate, or both (student teaching is usually one of the last steps completed in meeting several requirements for certification). Academic characteristics positively associated with preparing to be and becoming a teacher, shown in the last segment of the pipeline, included having earned a bachelor’s degree before the 1992–93 degree, earning the latter degree from a public non-doctorate-granting institution, and having majored in education as an undergraduate. Graduates with these characteristics were more likely than their

**Table 6. Percentage distribution of 1992–93 bachelor's degree recipients' status in the teacher pipeline, by demographic, academic, and teacher pipeline characteristics: 2003**

Demographic, academic, and teacher pipeline characteristics	No entry into pipeline	Considered or applied at some point	Has taught, no training	Prepared, did not teach	Prepared and taught
Total	46.4	29.7	3.5	4.3	16.1
Gender					
Male	55.0	29.5	3.2	3.7	8.6
Female	39.4	29.9	3.8	4.7	22.2
Race/ethnicity <sup>1</sup>					
White	46.2	29.5	3.4	4.4	16.5
Black	38.8	38.4	4.8	2.3	15.7
Hispanic	42.9	28.9	4.2	3.4	20.7
Asian/Pacific Islander	65.0	21.4	2.7	6.5	4.4
Age at bachelor's degree completion					
22 or younger	47.6	28.1	3.8	4.3	16.2
23–24	47.3	31.0	2.8	3.7	15.3
25–29	44.2	33.6	3.9	4.2	14.2
30 or older	43.4	29.3	3.5	5.2	18.6
Attainment before 1992–93 bachelor's					
Associate's degree or less	47.0	29.7	3.4	4.2	15.7
Bachelor's degree or more	38.3	29.8	4.3	5.6	22.1
Bachelor's degree-granting institution					
Public non-doctorate-granting	41.0	26.7	2.8	5.8	23.8
Public doctorate-granting	49.7	29.1	3.1	3.9	14.3
Private not-for-profit non-doctorate-granting	43.3	33.4	4.3	3.6	15.4
Private not-for-profit doctorate-granting	47.1	32.4	5.4	3.7	11.5
Private for-profit 2-year-or-more	54.7	43.8	0.5	#	1.1
Baccalaureate degree major					
Business and management	62.3	30.8	1.6	2.2	3.1
Education	8.0	10.1	1.6	10.8	69.5
Health	58.4	30.3	2.7	3.1	5.5
Arts and humanities	34.2	33.2	10.4	4.6	17.6
Social/behavioral sciences	49.0	36.4	3.9	3.2	7.5
Science, mathematics, engineering	55.0	31.6	2.9	3.0	7.5
Other	46.9	33.3	3.7	4.5	11.5

See notes at end of table.

**Table 6. Percentage distribution of 1992–93 bachelor's degree recipients' status in the teacher pipeline, by demographic, academic, and teacher pipeline characteristics: 2003—Continued**

Demographic, academic, and teacher pipeline characteristics	No entry into pipeline	Considered or applied at some point	Has taught, no training	Prepared, did not teach	Prepared and taught
College entrance examination score <sup>2</sup>					
Lowest level	41.2	28.9	3.4	4.6	21.9
Middle level	47.9	28.4	3.1	4.3	16.4
Highest level	48.9	33.2	4.3	3.6	10.0
Test scores not available	45.8	30.0	3.7	4.7	15.8
Normalized undergraduate GPA					
Less than 2.25	47.9	37.4	5.1	3.9	5.8
2.25–2.74	51.0	31.1	2.8	3.8	11.4
2.75–3.24	46.1	27.6	3.1	4.5	18.8
3.25–3.74	44.6	29.4	3.5	4.2	18.2
3.75 or higher	42.1	28.3	4.5	5.7	19.5
Teaching experience before 1992–93 bachelor's					
Taught or prepared	†	1.5	26.4	5.8	66.3
Neither taught nor prepared	48.7	31.0	2.6	4.1	13.5
Teacher pipeline status through 1994 interview					
Was not considering teaching	66.3	27.5	1.3	2.7	2.2
Was considering	0.1	76.8	4.3	2.6	16.4
Had taught but not prepared	†	†	55.9	†	44.1
Had prepared but not taught	†	†	†	41.6	58.4
Had prepared and taught	†	†	†	†	100.0

† Not applicable.

# Rounds to zero.

<sup>1</sup> Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin. Included in the totals but not shown separately are data for respondents who identified themselves as American Indian/Alaska Native or another race.

<sup>2</sup> Derived from College Board-, institution-, or student-reported SAT or ACT scores, where available.

NOTE: Detail may not sum to totals because of rounding. Estimates include graduates from the 50 states, DC, and Puerto Rico.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

counterparts in other categories to have taken preparation steps and to have taught by 2003 (table 6).

Other experiences in college (and before, for college entrance exams) were also predictors of whether graduates became prepared teachers. Graduates with lower CEE scores were more likely to prepare and teach by 2003, for example. On the other hand, those who earned relatively high grades in college were also more likely than others to have completed preparation and taught by 2003.

Pre-degree participation in teaching-related activities was related to preparation and teaching status by 2003. As one example, 66 percent of graduates who had either taught or trained to teach before completing the 1992–93 degree had completed preparation and taught by 2003, and another 26 percent had taught but without completing training (table 6). Many fewer, about 14 percent, of those who had neither taught nor trained to teach before their 1992–93 degree had completed preparation and taught 10 years later.

### ***Student Teaching and Certification***

The two steps graduates could complete to count as “prepared to teach,” as noted above, are completing a student teaching assignment or earning a teaching certificate. Student teaching is usually one of several requirements needed for certification. Overall, 17 percent of 1992–93 bachelor’s degree recipients did earn teaching certificates, while 4 out of 5 neither student taught nor earned a teaching certificate by 2003 (table 7).<sup>7</sup> Another 3 percent had student teaching experience but had not completed all additional requirements to earn a teaching certificate.

As with teaching experience, examined in the first half of this report, several demographic and academic characteristics of college graduates were related to obtaining teacher certification. Graduates who were relatively likely to earn certification included females (figure 13), Whites, Blacks, and Hispanics compared with Asians/Pacific Islanders (table 7), those who graduated from public non-doctorate-granting postsecondary institutions, and those who majored in education. For example, while 74 percent of education majors later earned certification, 18 percent of arts/humanities and 13 percent of “other” majors did so. Arts/humanities majors were more likely, at 18 percent, to have completed teaching certificates, compared with the other four majors categories below that rate. Nine percent or fewer of majors in other fields earned certification.

Similar to the outcome of having prepared and taught, discussed above, graduates who had relatively low CEE scores or high grades in college were more likely to have earned teaching certificates by 2003 (table 7). In addition, among those who had taught or trained to teach before completing their 1992–93 degree, two-thirds were certified teachers by 2003, compared with 15 percent among their peers who neither taught nor trained for teaching before completing their bachelor’s degree in 1992–93.

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<sup>7</sup> The 80 percent lacking preparation, shown in column 1, are the graduates distributed among the first three columns of table 6.

**Table 7. Percentage distribution of 1992–93 bachelor's degree recipients' preparation to teach, by demographic, academic, and teacher pipeline characteristics: 2003**

Demographic, academic, and teacher pipeline characteristics	No student teaching or certification	Student taught	Certified
Total	79.6	3.0	17.4
Gender			
Male	87.6	2.8	9.5
Female	73.0	3.2	23.8
Race/ethnicity <sup>1</sup>			
White	79.1	2.9	18.1
Black	82.1	3.4	14.5
Hispanic	76.0	3.0	21.1
Asian/Pacific Islander	89.1	5.5	5.4
Age at bachelor's degree completion			
22 or younger	79.5	3.3	17.2
23–24	81.0	2.1	16.9
25–29	81.7	2.7	15.7
30 or older	76.2	4.0	19.8
Attainment before 1992–93 bachelor's			
Associate's degree or less	80.1	2.8	17.1
Bachelor's degree or more	72.3	6.1	21.6
Bachelor's degree-granting institution			
Public non-doctorate-granting	70.4	3.7	25.9
Public doctorate-granting	81.8	2.3	15.9
Private not-for-profit non-doctorate-granting	81.0	3.5	15.5
Private not-for-profit doctorate-granting	84.9	3.7	11.4
Private for-profit 2-year-or-more	98.9	0.4	0.7
Baccalaureate degree major			
Business and management	94.7	1.4	3.9
Education	19.7	5.9	74.5
Health	91.4	3.3	5.3
Arts and humanities	77.8	4.3	18.0
Social/behavioral sciences	89.3	2.9	7.9
Science, mathematics, engineering	89.5	1.9	8.6
Other	84.0	3.3	12.7
College entrance examination score <sup>2</sup>			
Lowest level	73.5	4.2	22.3
Middle level	79.4	2.6	18.0
Highest level	86.4	2.7	11.0
Test scores not available	79.5	3.1	17.3

See notes at end of table.

**Table 7. Percentage distribution of 1992–93 bachelor's degree recipients' preparation to teach, by demographic, academic, and teacher pipeline characteristics: 2003—Continued**

Demographic, academic, and teacher pipeline characteristics	No student teaching or certification	Student taught	Certified
Normalized undergraduate GPA			
Less than 2.25	90.3	3.3	6.4
2.25–2.74	84.8	2.9	12.4
2.75–3.24	76.8	3.1	20.2
3.25–3.74	77.5	2.6	19.9
3.75 or higher	74.8	4.4	20.8
Teaching experience before 1992–93 bachelor's			
Taught or prepared	27.9	5.1	67.0
Neither taught nor prepared	82.4	2.8	14.8
Teaching status in 2003 and before 1992–93 bachelor's			
Currently teaching, taught before bachelor's	#	4.8	95.2
Currently teaching, not before bachelor's	3.3	2.9	93.8
Had taught, taught before bachelor's	‡	‡	‡
Had taught, not before bachelor's	25.3	5.1	69.7
Never taught	94.7	2.5	2.8
Teacher pipeline status through 1994 interview			
Was not considering teaching	95.1	2.2	2.7
Was considering	81.1	2.4	16.5
Had taught but not prepared	55.9	7.0	37.2
Had prepared but not taught	†	13.8	86.2
Had prepared and taught	†	2.3	97.7

† Not applicable.

# Rounds to zero.

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

<sup>1</sup> Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin. Included in the totals but not shown separately are data for respondents who identified themselves as American Indian/Alaska Native or another race.

<sup>2</sup> Derived from College Board-, institution-, or student-reported SAT or ACT scores, where available.

NOTE: Detail may not sum to totals because of rounding. Estimates include graduates from the 50 states, DC, and Puerto Rico.

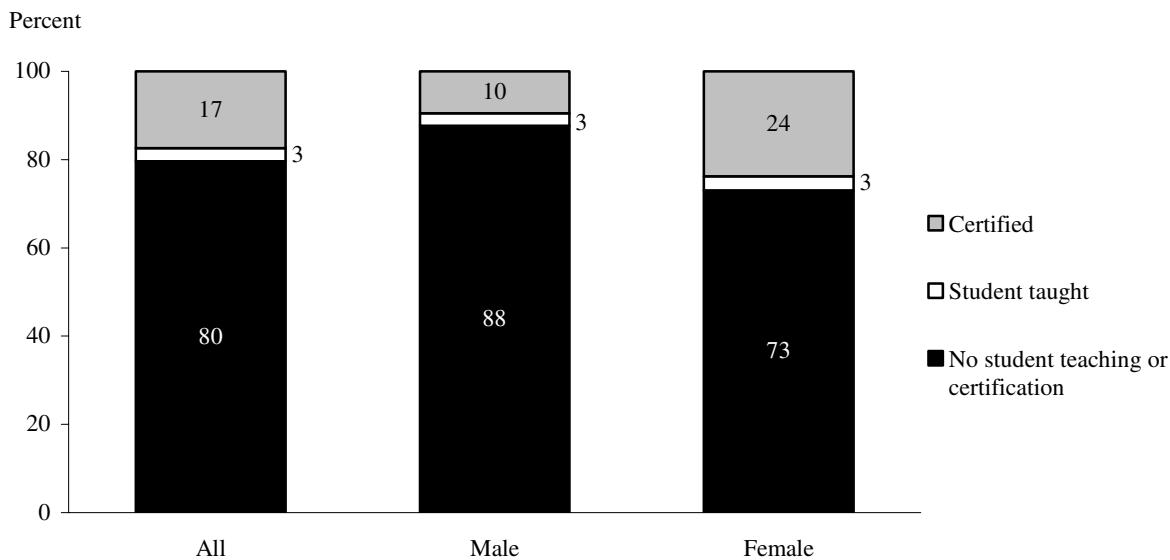
SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

### ***Graduates Who Left the Teacher Pipeline***

As discussed elsewhere regarding graduates who had no teaching experience, males and Asians/Pacific Islanders in this cohort were less likely than females and those from other racial/ethnic groups to have entered the teacher pipeline (table 6). In addition, 47 percent of

**Figure 13. Percentage distributions of 1992–93 bachelor's degree recipients by preparation to teach, by gender: 2003**

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NOTE: Detail may not sum to totals because of rounding. Estimates include graduates from the 50 states, DC, and Puerto Rico.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

graduates who had attained an associate's degree (or no degree) before the 1992–93 degree had not considered teaching (i.e., had no pipeline entry), compared with 38 percent of those who already had a bachelor's or higher degree before 1992–93 (table 6).

Graduates who had majored in business or management; health; or science, mathematics, or engineering were, in general, more likely than those with other majors to have not entered the teacher pipeline. At least 55 percent of majors in those three categories took no steps to enter the teacher pipeline, compared with 8 percent of education majors. As with the teaching experience data discussed in the first section of this report, graduates with low CEE scores were more likely than those with mid-range or high scores to enter the teacher pipeline.<sup>8</sup> Similarly, higher grades in college were associated with generally lower rates of considering or applying to teach. However, graduates were more likely to prepare and teach if they had earned higher grades in college. For both test scores and grades, patterns can be seen more clearly with the rates at which graduates prepared and became teachers, discussed in the next section.

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<sup>8</sup> This point can be deduced from the data in table 6 showing that with middle or high scores, graduates were less likely to have never entered the teacher pipeline.

### ***Becoming a Prepared Teacher***

Graduates count as “prepared to teach” in this report if they completed a student teaching assignment or earned a teaching certificate, or both (student teaching is usually one of the last steps completed in meeting several requirements for certification). Academic characteristics positively associated with preparing to be and becoming a teacher, shown in the last segment of the pipeline, included having earned a bachelor’s degree before the 1992–93 degree, earning the latter degree from a public non-doctorate-granting institution, and having majored in education as an undergraduate. Graduates with these characteristics were more likely than their counterparts in other categories to have taken preparation steps and to have taught by 2003 (table 6). Other experiences in college (and before, for college entrance exams) were also predictors of whether graduates became prepared teachers. Graduates with lower CEE scores were more likely to prepare and teach by 2003, for example. On the other hand, those who earned relatively high grades in college were also more likely than others to have completed preparation and taught by 2003.

Pre-degree participation in teaching-related activities was related to preparation and teaching status by 2003. As one example, 66 percent of graduates who had either taught or trained to teach before completing the 1992–93 degree had completed preparation and taught by 2003, and another 26 percent had taught but without completing training (table 6). Many fewer, about 14 percent, of those who had neither taught nor trained to teach before their 1992–93 degree had completed preparation and taught 10 years later.

### **Student Teaching and Certification**

The two steps graduates could complete to count as “prepared to teach,” as noted above, are completing a student teaching assignment or earning a teaching certificate; student teaching is usually one of several requirements needed for certification. Overall, 17 percent of 1992–93 bachelor’s degree recipients did earn teaching certificates, while 4 out of 5 neither student taught nor earned a teaching certificate by 2003 (table 7).<sup>9</sup> Another 3 percent had student teaching experience but had not completed all additional requirements to earn a teaching certificate.

As with teaching experience, examined in the first half of this report, several demographic and academic characteristics of college graduates were related to obtaining teacher certification. Graduates who were relatively likely to earn certification included females (figure 13), Whites, Blacks, and Hispanics compared with Asians/Pacific Islanders (table 7), those who graduated from public non-doctorate-granting postsecondary institutions, and those who majored in

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<sup>9</sup> The 80 percent lacking preparation, shown in column 1, are the graduates distributed among the first three columns of table 6.

education. For example, while 74 percent of education majors later earned certification, 18 percent of arts/humanities and 13 percent of “other” majors did so. Arts/humanities majors were more likely, at 18 percent, to have completed teaching certificates, compared with graduates in the other four majors categories below that rate. Nine percent or fewer of majors in other fields earned certification.

Similar to the outcome of having prepared and taught, discussed above, graduates who had relatively low CEE scores or high grades in college were more likely to have earned teaching certificates by 2003 (table 7). In addition, among those who had taught or trained to teach before completing their 1992–93 degree, two-thirds were certified teachers by 2003, compared to 15 percent among their peers who neither taught nor trained for teaching before completing their bachelor’s degree in 1992–93.

## **Reasons for Deciding Not to Teach**

Graduates who had entered the teacher pipeline, defined as considering teaching at some point, but who neither applied for a teaching job nor taught since 1997 were asked about reasons for that decision. The most commonly mentioned reasons for not entering teaching were lack of interest (36 percent), having another job already (30 percent), and wanting higher pay (25 percent) (table 8).<sup>10</sup>

Several gender differences in reasons for deciding against teaching were observed. Men were more likely than women to say that wanting higher pay than teaching provides figured into their decision, 32 versus 19 percent (figure 14 and table 8). Men were also more likely than women to say they already had another job or they had received a better offer than teaching, while females were more inclined to report some “other reason” not specified in the survey interview.

Among the relevant academic characteristics, graduates whose attainment before the 1992–93 bachelor’s degree was less than a bachelor’s were more likely than those with higher prior attainment to report that they sought higher pay in rejecting teaching (25 vs. 14 percent). Additionally, as CEE scores increased, 1992–93 graduates were more likely to select the following reasons for not entering teaching: poor working conditions, low pay, and having another job already.

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<sup>10</sup> A possible difference between wanting higher pay and “other” reasons was not statistically significant.

**Table 8. Of 1992–93 bachelor's degree recipients who had entered the teacher pipeline but neither taught nor applied for a teaching position, percentage who cited various reasons for deciding against teaching, by demographic, academic, and teacher pipeline characteristics: 2003**

Demographic, academic, and teacher pipeline characteristics	Not interested in teaching	Already in other job	Wanted higher salary	Other reason	Not yet certified	Have not taken tests	Teachers' working conditions	Received better offer	Have not passed tests
Total	35.9	29.9	24.7	20.2	18.0	11.8	6.2	4.5	1.8
Gender									
Male	34.7	32.7	31.8	16.9	15.7	10.3	6.3	6.6	2.0
Female	36.9	27.6	18.8	22.9	19.9	13.0	6.1	2.9	1.7
Race/ethnicity <sup>1</sup>									
White	35.5	30.2	24.9	19.8	18.6	11.9	6.1	4.4	1.8
Black	38.4	31.1	23.4	18.9	15.6	13.5	2.6	4.6	0.5
Hispanic	41.6	26.0	24.3	25.5	11.1	12.5	8.4	4.7	1.8
Asian/Pacific Islander	40.2	27.7	24.5	22.6	13.1	8.7	8.4	6.0	5.5
Attainment before 1992–93 bachelor's									
Associate's degree or less	35.5	29.6	25.4	20.2	17.9	11.9	6.4	4.6	1.9
Bachelor's degree or more	41.5	33.6	14.3	19.8	19.6	10.7	2.9	3.4	1.4
Bachelor's degree-granting institution <sup>2</sup>									
Public non-doctorate-granting	37.3	29.5	20.7	21.6	19.8	11.7	6.0	4.4	1.1
Public doctorate-granting	35.1	32.3	29.1	19.7	18.5	13.3	8.3	4.7	2.3
Private not-for-profit non-doctorate-granting	33.3	27.9	24.0	19.4	18.3	12.5	4.7	3.7	1.8
Private not-for-profit doctorate-granting	38.2	27.0	22.1	20.2	14.0	7.6	3.8	5.6	2.1
Baccalaureate degree major									
Business and management	28.0	28.0	31.8	19.9	18.8	14.4	7.5	3.7	2.5
Education	41.5	31.3	18.8	23.8	13.8	7.9	8.1	10.9	2.0
Health	37.6	31.5	20.7	27.3	9.3	4.8	3.2	3.4	1.1
Arts and humanities	41.2	27.1	19.2	22.3	16.9	13.1	6.3	5.3	2.1
Social/behavioral sciences	39.1	32.7	20.6	17.6	19.1	10.9	4.2	3.5	1.7
Science, mathematics, engineering	34.2	32.0	30.4	19.1	17.8	12.9	7.3	5.7	1.4
Other	37.7	27.6	21.9	18.4	22.8	12.2	5.9	2.5	1.6

See notes at end of table.

**Table 8. Of 1992–93 bachelor's degree recipients who had entered the teacher pipeline but neither taught nor applied for a teaching position, percentage who cited various reasons for deciding against teaching, by demographic, academic, and teacher pipeline characteristics: 2003**  
**—Continued**

Demographic, academic, and teacher pipeline characteristics	Not interested in teaching	Already in other job	Wanted higher salary	Other reason	Not yet certified	Have not taken tests	Teachers' working conditions	Received better offer	Have not passed tests
College entrance examination score <sup>3</sup>									
Lowest level	32.2	26.0	22.1	21.2	21.1	11.9	3.1	5.1	1.6
Middle level	35.5	31.5	26.4	19.1	18.0	11.3	7.4	4.4	1.5
Highest level	38.6	34.2	30.6	17.5	15.7	13.1	8.8	5.9	3.4
Test scores not available	37.5	25.9	17.2	24.2	17.7	11.4	3.6	2.8	1.1
Normalized undergraduate GPA									
Less than 2.25	43.3	13.8	40.3	6.9	25.0	17.6	7.6	2.3	#
2.25–2.74	30.0	30.3	31.4	22.4	19.8	11.8	6.7	3.5	1.3
2.75–3.24	34.0	29.4	21.9	22.1	20.0	12.9	6.2	5.6	2.3
3.25–3.74	36.6	33.0	25.3	17.2	18.5	11.8	5.8	4.2	1.1
3.75 or higher	44.3	31.1	23.8	18.6	8.3	9.0	7.0	3.3	2.6
Teaching experience before 1992–93 bachelor's <sup>4</sup>									
Neither taught nor prepared	36.0	30.1	24.4	20.3	18.2	11.8	6.2	4.4	1.8
Teacher pipeline status through 1994 interview <sup>5</sup>									
Was not considering teaching	31.0	30.6	26.4	21.3	21.4	12.8	6.6	4.2	2.0
Was considering	48.2	27.9	21.0	16.6	13.6	10.9	4.7	3.7	1.7
Had prepared but not taught	30.8	34.4	16.5	31.2	6.7	5.2	9.6	12.3	2.3

<sup>1</sup> Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin. Included in the totals but not shown separately are data for American Indian/Alaska Native respondents and those who identified themselves with another race.

<sup>2</sup> Included in the totals but not shown separately are data for respondents who attended private for-profit 2-year-or-more institutions.

<sup>3</sup> Derived from College Board-, institution-, or student-reported SAT or ACT scores, where available.

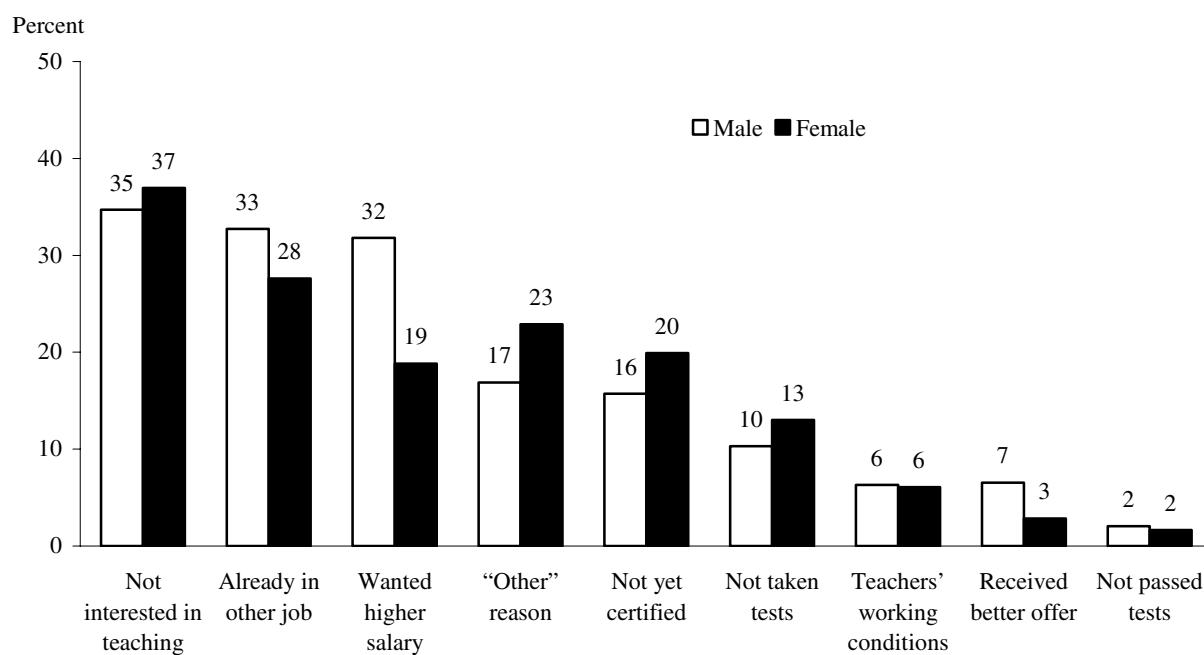
<sup>4</sup> Included in the totals but not shown separately are data for respondents who taught or trained before their 1992–93 bachelor's degree.

<sup>5</sup> Included in the totals but not shown separately are data for respondents who had taught but not prepared or had prepared and taught.

NOTE: Detail may not sum to totals because of rounding. Estimates include graduates from the 50 states, DC, and Puerto Rico.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

**Figure 14. Of 1992–93 bachelor's degree recipients who had entered the teacher pipeline but neither taught nor applied for a teaching position, percentage who cited various reasons for deciding against teaching, by gender: 2003**



NOTE: Estimates include graduates from the 50 states, DC, and Puerto Rico.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

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## **Summary and Conclusion**

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In 2003, 20 percent of 1992–93 bachelor's degree recipients had taught in an elementary or secondary school, with 11 percent teaching when they were interviewed in 2003 and another 9 percent having taught at some point in the past. Women in the cohort were more than twice as likely as men to report in 2003 that they were currently teaching and about twice as likely as men to have taught previously. Graduates who were older than age 30 when they completed their 1993 bachelor's degree were also in general more likely than others to be teaching in 2003, as were White, Black, and Hispanic graduates compared with Asian/Pacific Islander graduates.

Among the academic characteristics associated with a propensity to teach were the types of undergraduate institutions attended and undergraduate major field of study. For example, graduates of public 4-year nondoctoral institutions were more likely than graduates from other institutions to be teaching in 2003. Education majors were also more likely than those from other disciplines to be teachers in 2003—and to have taught only in the past. Nevertheless, 29 percent of education majors had no teaching experience by 2003.

Several other academic measures were related to the likelihood that college graduates later joined the teaching profession. First, graduates' CEE scores were inversely related to their likelihood of being teachers in 2003. On the other hand, those with higher college GPAs were more likely than those with lower grades to be currently teaching. Graduates whose highest earned degree in 2003 was a master's or a post-baccalaureate certificate became teachers in larger proportions than those who attained bachelor's degrees or graduate degrees beyond a master's.

In general, teachers expressed satisfaction with the profession. Nearly all graduates who were teaching in 2003 said they were satisfied with teaching overall (93 percent). Teachers were more satisfied with the learning environment at their school than with aspects such as parent support, pay, and students' motivation to learn. Ninety percent of teachers reported that they would choose teaching again, and two-thirds planned to remain a teacher for the rest of their working life. Among teachers who were not teaching in 2003, females often left for family-related reasons (29 percent), while males often left for a job outside of the education field (32 percent).

Nearly one-half of all 1992–93 bachelor's degree recipients reported that they had never considered teaching nor taken any steps to prepare for the profession. Another nearly one-third had either considered teaching or applied for a teaching job at some point in the previous decade but not advanced further in the teacher supply pipeline. The most commonly cited reasons for not pursuing teaching were lack of interest, having another job already, and wanting higher pay. Males were more likely than females to have sought higher pay, to have had another job already, and to have received an offer for a job they considered better than teaching.

Sixteen percent of the cohort had both prepared to teach and taught. Graduates with the following academic characteristics were more likely to prepare for and become a teacher: having earned another bachelor's degree before the 1992–93 degree, earning the latter degree from a public non-doctorate-granting institution, having an undergraduate major in education, and having a relatively high grade point average from college and relatively low CEE scores.

About 4 in 5 of this cohort of college graduates neither student taught nor earned teaching certificates by 2003. About 17 percent (among the remaining 20 percent) earned teaching certificates. Graduates who were relatively likely to hold certification included females, Whites and Blacks (versus Asians/Pacific Islanders), those who graduated from public non-doctorate-granting postsecondary institutions, and those who majored in education.

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## Appendix A—Glossary

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This glossary describes the variables used in this report. The items were taken directly from the NCES B&B:93/03 Data Analysis System (DAS), a Web-based NCES analysis tool that generates tables from the B&B:93/03 data. (See appendix B for a description of the DAS.) In the index below, the variables are organized by general topic and, within topic, listed alphabetically by variable name. The glossary is in alphabetical order by variable name (displayed in capital letters to the right of the label below).

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## *Appendix A—Glossary*

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*DAS variable*

### **Race/ethnicity**

**B2ETHNIC**

Indicates the race and ethnicity of the respondent. Created by combining respondents' reported race (American Indian/Alaska Native, Asian/Pacific Islander, Black, White, or Other) and whether they were of Hispanic origin. Included in the totals but not shown separately (because of too few cases) are data for American Indian/Alaska Native respondents and those who identified themselves with a race other than the four shown. The resulting categories are as follows.

- White, non-Hispanic
- Black, non-Hispanic
- Hispanic
- Asian/Pacific Islander

### **Gender**

**B2RSEX**

Indicates student-reported gender.

- Male
- Female

### **Main field taught in most recent job**

**B3FIELD**

For respondents who have taught or are currently teaching, this variable brings together data from the 1994, 1997, and 2003 surveys on the main assignment field of their most recent teaching job.

- General elementary (combined elementary with early childhood education)
- Business and vocational
- Science and mathematics (combined the separate fields)
- Foreign languages
- Special education or ESL/bilingual (combined the separate fields)
- English (combined English, journalism, reading, and writing)
- Social studies (combined economics, political systems, history, civics, and social studies)
- Fine arts (combined art, drama, music)
- Other (combined numerous fields, including health, physical education, and secondary education)

### **Full-time or part-time teaching job**

**B3FTP1**

For respondents who had taught since 1997 or were currently teaching in 2003, this variable shows the employment status of their most recent teaching job (excludes those who taught only as substitutes or teacher's aides).

- Full-time
- Part-time

### **2003 job: generally satisfied**

**B3GENSAT**

This variable indicates whether respondents were generally satisfied with their current job in 2003 (applies to those who were employed at the time of the interview). This item and the others related to teacher satisfaction are simple yes/no questions, they did not allow for different degrees of satisfaction.

**DAS variable****Highest degree attained by 2003****B3HDC03**

The highest degree the respondent had attained by 2003.

- Bachelor's degree
- Post-baccalaureate certificate
- Master's degree
- Post-master's certificate, doctorate, or first-professional degree

**Reason left teaching by 2003****B3LFTTCH**

Provides the primary reason that respondents who were teaching in the past but had left the profession by 2003 decided to leave (excluding those who indicated they plan to return to/continue classroom teaching.)

- Low pay
- Took a sabbatical or other break from teaching
- Laid off or work force reduction
- Changed to a job outside of education
- Changed to a nonteaching job within education
- Relocated
- Raising a family or fulfill other family demands
- Health reasons
- Difficulty with students, parents, and/or administration
- Other

**Sector of school, most recent teaching job****B3MRSECT**

For respondents who have taught or are currently teaching, this variable brings together data from the 1994, 1997, and 2003 surveys on the sector of the school at which the respondent most recently taught.

- Public
- Private

**School's percent free/reduced-price lunch recipients, most recent teaching job****B3MRSFLE**

For respondents who have taught or are currently teaching, this continuous variable brings together data from the 1994, 1997, and 2003 surveys on the percentage of students who were free/reduced-price lunch recipients at the school at which the respondent most recently taught.

**Level of school, most recent teaching job****B3MRSLEV**

For respondents who have taught or are currently teaching, this variable brings together data from the 1994, 1997, and 2003 surveys on the level of the school at which the respondent most recently taught.

- Elementary
- Secondary
- Combined

*DAS variable*

**School's community type, most recent teaching job**

**B3MRSLOC**

For respondents who have taught or are currently teaching, this variable brings together data from the 1994, 1997, and 2003 surveys on the community type of the most recent school in which the respondent taught.

- Central city (combines schools in large and mid-size central city locations)
- Urban fringe (combines schools in urban fringes of large cities and mid-size cities)
- Small town/rural (combines small town with rural schools)

**School's percent minority enrollment, most recent teaching job**

**B3MRSMPC**

For respondents who have taught or are currently teaching, this continuous variable brings together data from the 1994, 1997, and 2003 surveys on the percentage of students who were of minority racial/ethnic backgrounds at the most recent school in which the respondent taught.

**Reason did not apply for teaching position**

Respondents who did not apply for a teaching position were asked, “What are the reasons you did not apply for a teaching position? (Please check all that apply.)”

Not interested in teaching	<b>B3NOAPA</b>
Poor teaching conditions	<b>B3NOAPB</b>
Wanted higher salary	<b>B3NOAPC</b>
Already in other job	<b>B3NOAPE</b>
Received better offer	<b>B3NOAPF</b>
Haven't passed tests	<b>B3NOAPG</b>
Haven't taken tests	<b>B3NOAPH</b>
Not yet certified	<b>B3NOAPI</b>
Other reason	<b>B3NOAPX</b>

**Teacher pipeline status at 2003 interview**

**B3PIPLIN**

This variable measures extent of involvement with teaching, using variables from the 1994, 1997, and 2003 interviews. Respondents who had taught were categorized by whether they had teacher certification, had done student teaching, or lacked training. Those who had not taught were categorized by whether they had certification, had student taught, applied for teaching jobs, considered teaching, or had no interest in teaching/took no action to prepare. Table 6 in this report used the five categories listed on the left in the first grouping below, while table 7 used the three categories in the latter grouping below. (Numbers in parentheses are the value codes for B3PIPLIN.)

*First grouping of categories:*

No entry into pipeline	No interest in teaching or took no action to prepare (0)
Considered or applied at some point	Combined these categories: Considered teaching at other time (1); Was considering at time of the interview (2); Had applied to teach (3)
Taught, no training	Had taught without training (4)
Prepared, didn't teach	Student taught, did not teach, no certificate; or Certificate, did not teach (5 or 7)
Prepared and taught	Student taught, taught, no certificate; or Certificate, taught (6 or 8)

**DAS variable****Teacher pipeline status at 2003 interview—continued****B3PIPLIN***Second grouping of categories:*

Not prepared (neither student taught nor certified)

Combined these categories: No interest in teaching or took no action to prepare (0); Considered teaching at some other time (1); Was considering at time of the interview (2); Had applied to teach (3); and Had taught without training (4)

Student taught

Student taught, did not teach, no certificate; or Student taught, taught, no certificate (5 or 6)

Certified

Combined these categories: Certificate, did not teach; and Certificate, taught (7 or 8)

**Would go into teaching again****B3TCHAGN**

For respondents who were currently teaching, this variable indicates whether they would choose teaching as a career if they had the decision to make over again.

**How long expect to stay in teaching****B3TCHDR**

For respondents who were currently teaching, this variable indicates how long they think they will stay in teaching.

- For the rest of the time working
- Until a nonteaching job in education becomes available
- Until something better comes along
- Other

**Teaching status by 2003****B3TCHST**

This derived variable indicates whether respondents were currently teaching, had taught previously, or had never taught by the 2003 interview.

- Teaching
- Had taught but not teaching
- Never taught

**Satisfaction: student motivation****B3TSATA**

For respondents who had taught since 1997 or were currently teaching, this variable indicates whether respondents were satisfied with student motivation to learn in their current or most recent teaching job (yes or no).

**Satisfaction: school learning environment****B3TSATB**

For respondents who had taught since 1997 or were currently teaching, this variable indicates whether respondents were satisfied with the school's learning environment in their current or most recent teaching job (yes or no).

**Satisfaction: student discipline****B3TSATC**

For respondents who had taught since 1997 or were currently teaching, this variable indicates whether respondents were satisfied with student discipline in their current or most recent teaching job (yes or no).

## *Appendix A—Glossary*

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*DAS variable*

### **Satisfaction: class size**

**B3TSATD**

For respondents who had taught since 1997 or were currently teaching, this variable indicates whether respondents were satisfied with class size(s) in their current or most recent teaching job (yes or no).

### **Satisfaction: support from parents**

**B3TSATE**

For respondents who had taught since 1997 or were currently teaching, this variable indicates whether respondents were satisfied with support from parents in their current or most recent teaching job (yes or no).

### **Baccalaureate degree major**

**BAMAJOR**

Major field of study for the bachelor's degree. "Other" includes such fields as agriculture, communications, consumer and personal services, home economics, interdisciplinary studies, industrial arts, and general or basic studies.

- Business and management
- Education
- Health
- Arts and humanities
- Social and behavioral sciences
- Science, mathematics, or engineering
- Other

### **Age at bachelor's degree completion**

**CCAGEBA**

Indicates the respondent's age when they received their 1992–93 bachelor's degree. The following categories are used:

- 22 or younger
- 23–24
- 25–29
- 30 or older

### **Teaching status in 2003 and before 1992–93**

**FINTSTAT**

This derived variable combines the respondent's teaching status in 2003 with teaching experience, both after 1992–93 through 2003 and before earning his or her 1992–93 bachelor's degree. In some tables the category for "never taught" was eliminated with a filter, so that only respondents in the other four categories are included.

- Currently teaching and taught before bachelor's degree
- Currently teaching, did not teach before bachelor's degree
- Had taught before and since bachelor's degree
- Had taught but not before bachelor's degree
- Never taught

**DAS variable*****First postsecondary institution attended*****FSCTYPE**

This variable gives the type of postsecondary institution the respondent first attended. It was created by determining the earliest enrollment date from the sample school and any other school attended before receiving the bachelor's degree at the sample school. Included in the totals but not shown separately are respondents who began at several other types of institutions (for-profit institutions, public less-than-2-year institutions, or private not-for-profit less-than-4-year institutions).

- Public 2-year
- Public 4-year
- Private not-for-profit 4-year

***Attainment before 1992–93 bachelor's*****HIOOTHDEG**

The highest degree the respondent had completed prior to completing the 1992–93 bachelor's degree.

- |                            |  |
|----------------------------|--|
| Associate's degree or less | No prior attainment; or attained certificate, license, or associate's degree   |
| Bachelor's degree or more  | Bachelor's degree, post-baccalaureate certificate, master's degree, post-master's certificate, first-professional degree, or doctorate |

***Normalized undergraduate GPA*****NORMGPA**

Normalizes the respondent's cumulative grade point average (GPA) on a 4.0 scale over the 4 years of college, as recorded at the sample school. The following categories are used:

- Less than 2.25
- 2.25–2.74
- 2.75–3.24
- 3.25–3.74
- 3.75 or higher

***Teacher pipeline status at 1994 interview*****Pipeline**

This variable measures the respondent's extent of preparation for and experience with teaching by the first follow-up, conducted in 1994. First, the variable identifies the group who had never considered teaching. Then it categorizes respondents by whether they had teacher preparation (had completed student teaching or had received provisional, regular, or advanced teacher certification) and whether they had any teaching experience.

- Was not considering teaching
- Did not prepare or teach
- Taught but had not prepared
- Prepared but did not teach
- Had prepared and taught

*DAS variable*

**College entrance examination scores**

**SATACTQ2**

Indicates the category in the distribution for respondent's combined SAT or ACT (verbal and mathematics) scores, or a combination if both were available for a given case. About 20 percent of cases lacked score data, generally because the student did not take either test; some colleges do not require applicants to provide scores on these tests.

Lowest level	Lowest 25 percent of cases
Middle level	Middle 50 percent of cases
Highest level	Highest 25 percent of cases
Did not take test	No SAT/ACT tests scores available

**Bachelor's degree-granting institution**

**SECTOR\_B**

Describes the type of institution from which respondents received the 1992–93 bachelor's degree. This variable takes into account both institutional level (the institution's highest type of degree or certificate awarded and length of programs), and control (the institution's source of revenue and control of operations).

Public non-doctorate-granting
Public doctorate-granting
Private not-for-profit non-doctorate-granting
Private not-for-profit doctorate-granting
Private for-profit 2-year or more

**Teaching experience before 1992–93 bachelor's**

**TEACHUNV**

This derived variable categorizes respondents based on whether they had taught school before or been certified to teach 1 year or more before obtaining the 1992–93 bachelor's degree.

Had taught or trained to teach before degree
Had not taught or trained before; eligible to enter teacher pipeline

## **Appendix B—Technical Notes and Methodology**

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### **The 1993–2003 Baccalaureate and Beyond Longitudinal Study**

The estimates and statistics reported in the tables and figures of this report are based on data from the first, second, and third follow-ups of the 1993–2003 Baccalaureate and Beyond Longitudinal Study (B&B:93/03). This study tracks the experiences of a cohort of college graduates who received a baccalaureate degree during the 1992–93 academic year and were first interviewed as part of the 1992–93 National Postsecondary Student Aid Study (NPSAS:93), conducted by the U.S. Department of Education’s National Center for Education Statistics. NPSAS:93 was based on a nationally representative sample of all students in postsecondary education institutions, including undergraduate, graduate, and first-professional students. For NPSAS:93, information was obtained from more than 1,000 postsecondary institutions on approximately 50,000 undergraduates and over 13,000 graduate students. For B&B:93/03, those members of the NPSAS:93 sample who completed a bachelor’s degree between July 1, 1992, and June 30, 1993, were identified and contacted for a 1-year follow-up interview in 1994. The second follow-up of the B&B cohort occurred 4 years after graduation in 1997. The final follow-up 10 years after graduation, in 2003, is the focus of this report. The estimates in this report are based on the results of these interviews with roughly 9,000 bachelor’s degree recipients, representing about 1.2 million bachelor’s degree completers from 1992–93. For more information on the final 2003 data collected in the B&B series, consult the *1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03) Methodology Report* (Wine et al. 2005).

The NPSAS:93 sample, while representative and statistically accurate, was not a simple random sample. Instead, the survey sample was selected using a more complex three-step procedure with stratified samples and differential probabilities of selection at each level. Postsecondary institutions were initially selected within geographic strata. Once institutions were organized by zip code and state, they were further stratified by control (i.e., public, private not-for-profit, or private for-profit) and degree offering (less-than-2-year, 2- to 3-year, 4-year non-doctorate-granting, and 4-year doctorate-granting). For more information about the NPSAS:93 survey, refer to the *Methodology Report for the 1993 National Postsecondary Student Aid Study* (Loft et al. 1995).

The 1994 B&B survey was the first follow-up interview of NPSAS:93 participants who received their bachelor's degrees between July 1992 and June 1993. Of 12,500 NPSAS:93 respondents who were identified as potentially eligible for the first follow-up survey, about 1,500 were determined to be ineligible. A total of about 10,000 eligible individuals completed the 1994 interview. Data collection for the second follow-up interview of the B&B cohort took place between April and December 1997. A total of over 11,000 individuals in the B&B cohort were determined eligible for follow-up in 1997. For the second follow-up, over 10,000 individuals completed the interview, yielding a response rate of 90 percent. For more information on procedures for the first and second follow-ups, consult the respective methodology reports (Green et al. 1996 for the first follow-up and Green et al. 1999 for the second follow-up).

In spring 2003, the third and final follow-up of the 1992–93 cohort of bachelor's degree recipients was conducted (some interviews were completed as late as September). For the first time, students were offered the opportunity to answer the B&B interview questions via the Internet. A single web-based interview was designed and programmed for use as a self-administered interview, along with telephone and in-person interview protocols. All respondents to the 1997 interview were included for participation in B&B:93/03. A subsample of about one-third of nonrespondents from 1997 was also included, for a final sample of about 10,400. Almost 9,000 individuals responded, yielding a weighted overall response rate of 73.6 percent, reflecting an institution response rate (in 1992) of 88.2 percent and a student response rate (in 2003) of 83.4 percent. For more details about these and other methodological procedures, consult the B&B:93/03 methodology report (Wine et al. 2005).

The B&B:93/03 data provide a current profile of the 1992–93 cohort of college graduates, including degree recipients who have been enrolled sporadically over time as well as those who went to college right after completing high school. The dataset contains comprehensive data on graduate enrollment, attendance, attainment, and student demographic characteristics. It provides a unique opportunity to understand variations in labor force participation, career stability, and financial worth over the past 10 years. There are data limitations, however. This follow-up was the conclusion of a 10-year study, and some attrition from the study is to be anticipated, although bachelor's degree recipients are likely to be relatively easier to locate than other populations and considerable efforts were undertaken both to minimize the extent of this problem and to adjust for its effects in the data (see Wine et al. 2005). Second, the previous waves of data collection for B&B:93/03 collected detailed information about complete education and employment histories for periods of 1 and 3 years, respectively; the final follow-up collected information for a period of 6 years, from the second follow-up in 1997 to the third in 2003. To ease respondent burden, summary information about employment histories was collected rather than complete, detailed information about each job held in the interim. For information on steps taken to ensure data

quality by evaluating instrument usability, effectiveness of the instrument in different modes, and data collection design, consult the B&B:93/03 methodology report (Wine et al. 2005).

## **Weighting**

All estimates in this report are weighted to compensate for unequal probability of selection into the B&B sample and to adjust for nonresponse. Two weights were developed. Cross-sectional weights were constructed for analyzing respondents to B&B:93/03. In addition, a panel (longitudinal) weight was constructed for analyzing those students who responded to all four surveys: NPSAS:93 (computer-assisted telephone interview component) and the 1994, 1997, and 2003 B&B interviews. The weights for the B&B:93/03 respondents were constructed by applying a series of adjustments to the 1994 B&B base weight. Specifically, adjustments were made to account for subsampling of nonrespondents from 1997, for sample members not located, for refusals among those who were located, and for types of nonresponse other than refusals among those who were located and did not refuse. Construction of the panel weight (WTC00), to be used for analyzing those who responded to all four surveys, included an additional adjustment for nonresponse: for the B&B:93/03 respondents who did not respond to all three of the previous surveys. The weight variable used for this report is WTC00. For more information on weighting, consult chapter 6, “Weighting and Variance Estimation,” of the B&B:93/03 methodology report (Wine et al. 2005).

## **Quality of Estimates**

Survey weights are computed with the goal of removing any bias that might result due to differential nonresponse and undercoverage. In order to measure the efficacy of bias-reducing adjustments, a series of analyses were conducted at the item and record levels. In the subsequent sections highlights of these analyses are summarized.

### ***Unit Response Rates and Bias Analysis***

For the approximately 10,400 sample students who were still eligible for B&B, the unweighted response rate was 86.3 percent, and the weighted response rate was 83.4 percent. For some items, the weighted response rate at the national level was also less than 85 percent. The effects of any potential bias due to nonresponse can influence overall data quality with greater proportions of missing information. Consequently, nonresponse bias analyses were conducted at the student and item levels when the corresponding weighted response rates were below 85 percent.

The bias in an estimated mean based on respondents,  $\bar{y}_R$ , is the difference between this estimate and the target parameter,  $\mu$ , which is the mean that would result if a complete census of the target population was conducted and all units responded. This bias can be expressed as follows:

$$B(\bar{y}_R) = \bar{y}_R - \mu$$

However, for variables that are available from the frame and base year (NPSAS:93) respondents,  $\mu$  can be estimated by  $\hat{\mu}$  without sampling error, in which case the bias in  $\bar{y}_R$  can then be estimated by:

$$\hat{B}(\bar{y}_R) = \bar{y}_R - \hat{\mu}$$

Moreover, an estimate of the population mean based on respondents and nonrespondents can be obtained by:

$$\hat{\mu} = (1 - \hat{\eta}) \bar{y}_R + \hat{\eta} \bar{y}_{NR}$$

where  $\hat{\eta}$  is the weighted unit nonresponse rate, based on weights prior to nonresponse adjustment. Consequently, the bias in  $\bar{y}_R$  can then be estimated by:

$$\hat{B}(\bar{y}_R) = \hat{\eta} (\bar{y}_R - \bar{y}_{NR})$$

That is, the estimate of the nonresponse bias is the difference between the mean for respondents and nonrespondents multiplied by the weighted nonresponse rate, using the student base weight prior to nonresponse adjustment.

### *Student-Level Nonresponse Bias Analysis*

A student respondent is defined as any sample member who is determined to be eligible for the study and has valid data for the selected set of analytical variables. As noted earlier, the unweighted student response rate was 86.3 percent, and the weighted response rate was 83.4 percent. A nonresponse bias analysis was conducted as a part of the nonresponse adjustment for the analysis weight. The nonresponse bias was estimated for the variables known for both respondents and nonrespondents within each institution type. These variables included the following:

- Age in the base year (NPSAS:93),
- Race/ethnicity,
- Gender,
- U.S. citizenship status,
- Attendance status in the base year,

- Institution control,
- Bureau of Economic Analysis Code (OBE) Region,
- Type of institution/enrollment category,
- B&B institution stratum,
- B&B student stratum,
- Whether applied for aid in the base year,
- Receipt of federal aid in the base year,
- Receipt of Pell Grant in the base year,
- Receipt of Stafford Loan in the base year,
- Receipt of state aid in the base year,
- Receipt of institution aid in the base year,
- Receipt of any aid in the base year,
- Prior respondent to either 1994 or 1997 interview,
- Income in the base year (parent income for dependent students and student income for independent students),
- Number of telephone numbers available during B&B:93/03 data collection,
- Number of times an answering machine was encountered during B&B:93/03, and
- Whether the student was located in a field cluster for B&B:93/03.

The steps for nonresponse bias analysis included estimating the nonresponse bias and testing (adjusting for multiple comparisons) to determine if the bias is significant at the 5 percent level. Second, nonresponse adjustment factors were computed using a subset of variables listed above. The nonresponse adjustments were designed to significantly reduce or eliminate nonresponse bias for variables included in the corresponding models. Third, after the weights were computed, any remaining bias was estimated for the variables listed above and statistical tests were performed to determine the significance of any remaining nonresponse bias.

The weighting adjustments reduced, and in some cases eliminated, bias for students. Prior to the nonresponse weighting adjustment, the response bias was statistically significantly different from zero for 21 percent of the variables; the mean of the absolute values of the biases was 0.40 and the median was 0.20. After the nonresponse weighting adjustment, none of the biases were significantly different from zero; the mean of the absolute values of the biases was 0.01 and median was 0.002.

### *Item-Level Bias Analysis*

Item response rates (*RRI*) are calculated as the ratio of the number of respondents for whom an in-scope response was obtained ( $I^x$  for item  $x$ ) to the number of respondents who are asked to answer that item. The number asked to answer an item is the number of unit level respondents ( $I$ ) minus the number of respondents with a valid skip item for item  $x$  ( $V^x$ ).

$$RRI^x = \frac{I^x}{I - V^x}$$

As indicated above, nonresponse bias analysis was conducted for the variables with item response rates below 85 percent. This analysis was further restricted to items with at least 50 students who were either eligible to answer the item based on their response to the gate question, or who did not respond to the gate question for an item. This bias analysis compared the distributions of respondents and nonrespondents to the item for several variables related to propensity to prepare for a teaching career and become a teacher: gender, race/ethnicity, type of institution from which the respondent earned their bachelor's degree, undergraduate major and GPA, and college entrance examination score. Overall, item nonresponse analysis was conducted for 117 items, but 106 of these had response rates below 85 percent because the respondent did not respond to the gate question. The nonresponse bias analysis indicated that some items do have statistically significant bias due to item nonresponse, but the magnitude of the bias is generally small. For detailed information about the items analyzed for nonresponse bias, see the B&B:93/03 methodology report (Wine et al. 2005).

Two variables used to produce the tables in this report had weighted response rates lower than 85 percent: B3TCHDR, which provides the duration the respondent plans to stay in teaching (among current teachers), and B3LFTTCH, which indicates the main reason for leaving teaching (among former teachers). Those missing data on how long they planned to stay in teaching were less likely than those with data to be White and non-Hispanic. They were also less likely to have earned their 1992–93 bachelor's degree at an institution in a category other than those shown in the tables and to have majored in education, compared to those with valid data. In addition, they were less likely than those with data to have an undergraduate grade point average (GPA) in the relatively high range of 3.25–3.74 and more likely to have a GPA in the low range of 2.25–2.74.

Respondents missing data on the main reason for leaving were more likely to be female or Hispanic, compared to those with valid responses on this measure, and less likely to be White, non-Hispanic. Those missing data on reason for leaving teaching were also less likely to have completed the bachelor's degree at a public doctorate-granting institution but more likely to have graduated from a non-doctorate-granting institution. They were also less likely than those with data to have majored in humanities or to have an undergraduate GPA in the range 3.25–3.74.

## **Imputation**

Selected variables from the 2003 interview had missing values imputed for nonresponse. The imputations were performed in three steps. In the first step, selected interview variables were imputed using the procedures described in the next section. Then, using the interview variables,

including the newly imputed values, derived variables (created by combining information from two or more interview variables) were constructed. In the final step, selected derived variables with remaining missing cases were imputed again, using the procedures described below. Table B-1 lists the two variables used in this report (both derived) that had weighted response weights lower than 85 percent; and table B-2 lists the variables used in this report that were imputed and shows the percentage of cases imputed for each variable.

Sequential hot deck imputation, a common procedure for managing item nonresponse, uses respondent data as donors to provide surrogate values for records with missing data. In sequential hot deck imputation, imputation classes are defined, generally consisting of a cross-classification of covariates, and then missing values are replaced sequentially from a single pass through the data within the imputation classes. A related procedure, weighted sequential hot deck imputation, takes into account the unequal probabilities of selection into the original sample by using the sampling weights to specify the expected number of times a particular respondent's answer will be used to replace a missing item. The expected selection frequencies are specified such that, over repeated applications of the algorithm, the expected value of the weighted distribution of the imputed values will equal in expectation, within imputation class, the weighted distribution of the reported answers.

Weighted sequential hot deck imputation was selected for B&B:93/03 in part because it has the advantage of controlling the number of times a respondent record can be used for imputation and gives each respondent record the chance to be selected for use as a hot deck donor. To implement the procedure, imputation classes and sorting variables relevant to each item being imputed were defined. If more than one sorting variable was used, a serpentine sort was performed in which the direction of the sort (ascending or descending) changed each time the value of the previous sorting variable changed. The serpentine sort minimized the change in student characteristics every time one of the sorting variables changed its value.

Imputation classes for the B&B:93/03 interview variables, and some of the derived variables, were developed using a Chi-Square Automatic Interaction Detector (CHAID) analysis where only respondent data were modeled (Kass 1980). The CHAID segmentation process first divided the data into groups based on categories of the most significant predictor of the item being imputed, and then split each of the groups into smaller subgroups based on the other predictor variables. The CHAID process also merged categories for variables found not to be significantly different. This splitting and merging process continued until no additional statistically significant predictors were found. Imputation classes for B&B:93/03 were then defined from the final CHAID segments.

**Table B-1. Variables with weighted response rates lower than 85 percent**

Variable name	Variable label	Item response rate
B3LFTTCH	Reason for leaving teaching	62.73
B3TCHDR	How long expect to stay in teaching	82.41

NOTE: Weighted item response rates were calculated by dividing the total weighted number of valid responses by the total population for whom the question was applicable. Bias analyses were conducted for variables with a weighted item response rate below 85 percent.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

**Table B-2. Imputation rates for variables that were imputed**

Variable name	Variable label	Weighted imputation rate	Unweighted imputation rate
B3HDG03	Highest degree attained by 2003	0.7	2.0
B3MRSECT	Sector of school most recently taught	2.6	0.6
B3MRSFLE	Percent free/reduced-price lunch, school most recently taught	4.0	26.7
B3MRSLEV	Level of school most recently taught	3.1	15.3
B3MRSLOC	Locale of school most recently taught	2.6	14.1
B3MRSMPC	Percent minority enrollment, most recent job	3.5	19.2
B3PIPLIN	Teacher pipeline status in 2003	0.8	1.0

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

### ***Imputation of Interview Variables***

The B&B:93/03 computer-assisted telephone interviewing (CATI) variables were separated into two groups depending on the respondent base (or variable conditions). The first (unconditional) group consisted of variables that applied to all respondents. The second (conditional) group consisted of variables that applied to only a subset of respondents. Within the unconditional group, variables were sorted by percentage missing and then imputed in order, from lowest percentage missing to highest. Within the conditional group, the variables were first sorted by conditionality and percentage missing, then imputed in the appropriate sequence. Since all CATI variables had less than 10 percent missing, a constant set of predictor variables was

used in a CHAID analysis to determine imputation classes for each imputation variable. The analysis used the following set of predictor variables: age, gender, race/ethnicity, U.S. citizenship, dependency status, prior respondent, receipt of federal aid, and institutional region, institutional type, and institutional level. Some of these predictor variables were missing for a small percentage of cases and were imputed first with a weighted sequential hot deck imputation.

### ***Imputation of Derived Variables***

Selected derived variables for B&B:93/03 were imputed sequentially in four batches, using a specific order determined by the variable conditions resulting from the longitudinal nature of this study. Imputing sequentially allowed these derived variables (or further derived variables resulting from them) to be used as class variables for imputing variables in subsequent batches. The process helped to ensure consistency across derived variables.

Most of the derived variables had several constraints defined by different combinations of data collected in prior rounds of the study. Therefore, a procedure for finding appropriate donor cases was developed before the imputation was performed. The procedure involved defining mutually exclusive groups or classes of respondents that met the constraints. The groups were used as the imputation classes for the weighted sequential hot deck imputation procedure. For the derived variables that did not have any constraints, a CHAID analysis was performed. The predictor variables included any prior imputed variables, including interview variables.

### ***Evaluation of Imputations***

Comparing imputation distributions within imputation classes is a key measure for determining whether or not the weighted sequential hot deck imputation procedure produced acceptable results. The more similar the distributions, the more successful the imputation process. For evaluation of the B&B:93/03 imputation results, distributions were considered to be similar when absolute differences were less than 5 percent. Absolute difference was calculated by subtracting the before-imputation weighted percentage from the after-imputation weighted percentage. No absolute differences greater than 5 percent were found for any comparison. However, if absolute differences greater than 5 percent had been found, then the unweighted distributions would have been examined to see if the large differences were due to small sample sizes.

## **Data Analysis System**

The estimates presented in this report were produced using the B&B:93/03 Data Analysis System Online (DAS), which includes data from the NPSAS:93 base year and the 1994, 1997, and 2003 B&B interviews. The Web-based DAS application makes it possible for users to specify and generate their own tables. With the DAS, users can replicate or expand upon the tables presented in this report. In addition to the table estimates, the DAS calculates accurate standard errors<sup>1</sup> and weighted sample sizes for these estimates. All standard errors for estimates presented in this report are shown in appendix C. If the number of valid cases is too small (fewer than 30) to produce a reliable estimate, the DAS prints the message “low-n” instead of the estimate. In addition to tables, the DAS will also produce a correlation matrix of selected variables to be used for linear regression models. Included in the output with the correlation matrix are the design effects (DEFTs) for each variable in the matrix. Since statistical procedures generally compute regression coefficients based on simple random sample assumptions, the standard errors must be adjusted with the design effects to take into account the stratified sampling method used in the survey.

The DAS can be accessed electronically at <http://nces.ed.gov/das>. For more information about the B&B:93/03 Data Analysis System, contact:

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## **Statistical Procedures**

Two types of statistical procedures were used in this report: testing differences between means (or proportions) and testing linear trends. Each procedure is described below.

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<sup>1</sup> The B&B sample is not a simple random sample, so simple random sample techniques for estimating sampling error cannot be applied to these data. The DAS takes into account the complexity of the sampling procedures and calculates standard errors appropriate for such samples.

## Differences Between Means

The descriptive comparisons were tested in this report using Student's  $t$  statistic. Differences between estimates are tested against the probability of a Type I error,<sup>2</sup> or significance level. The significance levels were determined by calculating the Student's  $t$  values for the differences between each pair of means or proportions and comparing these with published tables of significance levels for two-tailed hypothesis testing.

Student's  $t$  values may be computed to test the difference between estimates with the following formula:

$$t = \frac{E_1 - E_2}{\sqrt{se_1^2 + se_2^2}} \quad (1)$$

where  $E_1$  and  $E_2$  are the estimates to be compared and  $se_1$  and  $se_2$  are their corresponding standard errors. This formula is valid only for independent estimates. When estimates are not independent, a covariance term must be added to the formula:

$$t = \frac{E_1 - E_2}{\sqrt{se_1^2 + se_2^2 - 2(r)se_1 se_2}} \quad (2)$$

where  $r$  is the correlation between the two estimates.<sup>3</sup> This formula is used when comparing two percentages from a distribution that adds to 100. If the comparison is between the mean of a subgroup and the mean of the total group, the following formula is used:

$$t = \frac{E_{sub} - E_{tot}}{\sqrt{se_{sub}^2 + se_{tot}^2 - 2p se_{sub}^2}} \quad (3)$$

where  $p$  is the proportion of the total group contained in the subgroup.<sup>4</sup> The estimates, standard errors, and correlations can all be obtained from the DAS.

There are hazards in reporting statistical tests for each comparison. First, comparisons based on large  $t$  statistics may appear to merit special attention. This can be misleading since the magnitude of the  $t$  statistic is related not only to the observed differences in means or percentages but also to the number of respondents in the specific categories used for comparison. Hence, a

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<sup>2</sup> A Type I error occurs when one concludes that a difference observed in a sample reflects a true difference in the population from which the sample was drawn, when no such difference is present.

<sup>3</sup> U.S. Department of Education, National Center for Education Statistics. (1993). *A Note from the Chief Statistician, no. 2.*

<sup>4</sup> Ibid.

small difference compared across a large number of respondents would produce a large  $t$  statistic.

A second hazard in reporting statistical tests is the possibility that one can report a “false positive” or Type I error. In the case of a  $t$  statistic, this false positive would result when a difference measured with a particular sample showed a statistically significant difference when there is no difference in the underlying population. Statistical tests are designed to control this type of error, denoted by alpha. The alpha level of .05 selected for findings in this report indicates that a difference of a certain magnitude or larger would be produced no more than one time out of twenty when there was no actual difference between the quantities in the underlying population. When we test hypotheses that show  $t$  values at the .05 level or smaller, we treat this finding as rejecting the null hypothesis that there is no difference between the two quantities. Failing to detect a difference, however, does not necessarily imply the values are the same or equivalent.

In addition, some comparisons warrant exercising additional caution. When there are significant results not indicated by any hypothesis being tested or when we test a large number of comparisons in a table, Type I errors cannot be ignored. For example, when making paired comparisons among different levels of income, the probability of a Type I error for these comparisons taken as a group is larger than the probability for a single comparison.

When the either of the two situations described in the previous paragraph was encountered in this report, comparisons were made when  $p \leq .05/k$  for a particular pairwise comparison, where that comparison was one of  $k$  tests within a family. This guarantees both that the individual comparison would have  $p \leq .05$  and that for  $k$  comparisons within a family of possible comparisons, the significance level for all the comparisons will sum to  $p \leq .05$ .<sup>5</sup>

For example, in a comparison of males and females, only one comparison is possible (males versus females). In this family,  $k=1$ , and the comparison can be evaluated without adjusting the significance level. When students are divided into four racial/ethnic groups (as in the tables in this report) and all possible comparisons are made, then  $k=6$  and the significance level of each test must be  $p \leq .05/10$ , or  $p \leq .005$ . The formula for calculating family size ( $k$ ) is as follows:

$$k = \frac{j(j-1)}{2} \quad (4)$$

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<sup>5</sup> The standard that  $p \leq .05/k$  for each comparison is more stringent than the criterion that the significance level of the comparisons should sum to  $p \leq .05$ . For tables showing the  $t$  statistic required to ensure that  $p \leq .05/k$  for a particular family size and degrees of freedom, see Dunn 1961.

where  $j$  is the number of categories for the variable being tested. In the case of race/ethnicity, there are four racial/ethnic groups (Asian/Pacific Islander; Black, non-Hispanic; Hispanic; and White, non-Hispanic), so substituting 4 for  $j$  in equation 4,

$$k = \frac{4(4 - 1)}{2} = 6 .$$

### ***Linear Trends***

While many descriptive comparisons in this report were tested using Student's  $t$  statistic, some comparisons across categories of an ordered independent variable used a test for a linear trend across all categories, rather than a series of tests between pairs of categories. In this report, when differences among percentages of a dependent variable were examined relative to an independent variable, an Analysis of Variance (ANOVA) was used to test for a linear relationship between the two variables. To do this, ANOVA models included orthogonal linear contrasts corresponding to successive levels of the independent variable. The squares of the standard errors, the variance between the means, and the unweighted sample sizes were used to partition total sum of squares into within- and between-group sums of squares. These were used to create mean squares for the within- and between-group variance components and their corresponding  $F$  statistics, which were then compared with published values of  $F$  for a significance level of .05.<sup>6</sup> Significant values of both the overall  $F$  and the  $F$  associated with the linear contrast term were required as evidence of a linear relationship between the two variables. Means and standard errors were calculated by the DAS. Unweighted sample sizes were provided by NCES through a restricted-use data license agreement.

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<sup>6</sup> More information about ANOVA and significance testing using the  $F$  statistic can be found in any standard textbook on statistical methods in the social and behavioral sciences.

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## **Appendix C—Standard Error Tables**

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**Table C-1. Standard errors for table 1 and figures A and 1: Percentage distribution of 1992–93 bachelor's degree recipients' teaching status, by demographic characteristics: 2003**

Demographic characteristics	Taught at some point			
	Total	Currently teaching	Not currently teaching	Never taught
Total	0.61	0.46	0.41	0.61
Gender				
Male	0.64	0.51	0.45	0.64
Female	0.88	0.64	0.63	0.88
Race/ethnicity				
White	0.73	0.54	0.42	0.73
Black	2.64	2.2	1.41	2.64
Hispanic	2.59	2.7	1.47	2.59
Asian/Pacific Islander	2.19	1.05	1.73	2.19
Age at bachelor's degree completion				
22 or younger	0.8	0.51	0.58	0.8
23–24	1.11	0.96	0.67	1.11
25–29	1.82	1.08	1.4	1.82
30 or older	1.35	1.18	0.84	1.35

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

**Table C-2. Standard errors for table 2 and figures B, 2, 3, 4, and 5: Percentage distribution of 1992–93 bachelor's degree recipients' teaching status, by academic and teacher pipeline characteristics: 2003**

Academic and pipeline characteristics	Taught at some point			
	Total	Currently teaching	Not currently teaching	Never taught
Total	0.61	0.46	0.41	0.61
Attainment before 1992–93 bachelor's				
Associate's degree or less	0.64	0.48	0.41	0.64
Bachelor's degree or more	2.48	2.01	1.87	2.48
First postsecondary institution attended				
Public 2-year	1.49	1.12	1.23	1.49
Public 4-year	0.73	0.57	0.57	0.73
Private not-for-profit 4-year	1.10	0.70	0.67	1.10
Bachelor's degree-granting institution				
Public non-doctorate-granting	1.24	1.25	0.77	1.24
Public doctorate-granting	0.92	0.68	0.62	0.92
Private not-for-profit non-doctorate-granting	1.33	0.90	0.83	1.33
Private not-for-profit doctorate-granting	1.49	0.90	1.01	1.49
Private for-profit 2-year-or-more	1.18	0.37	1.02	1.18
Baccalaureate degree major				
Business and management	0.71	0.54	0.48	0.71
Education	2.04	1.78	1.79	2.04
Health	1.65	0.83	1.38	1.65
Arts and humanities	2.11	1.85	1.31	2.11
Social/behavioral sciences	0.88	0.74	0.62	0.88
Science, mathematics, or engineering	0.73	0.67	0.66	0.73
Other	1.21	1.28	0.86	1.21
College entrance examination score				
Lowest quarter	1.02	0.93	0.91	1.02
Middle two quarters	0.80	0.71	0.48	0.80
Highest quarter	1.17	0.84	0.74	1.17
Test scores not available	1.58	0.97	1.11	1.58
Normalized undergraduate GPA				
Less than 2.25	1.83	1.33	1.11	1.83
2.25–2.74	1.07	0.82	0.74	1.07
2.75–3.24	1.20	0.94	0.83	1.20
3.25–3.74	1.18	0.99	0.69	1.18
3.75 or higher	1.80	1.17	1.41	1.80

See notes at end of table.

**Table C-2. Standard errors for table 2 and figures B, 2, 3, 4, and 5: Percentage distribution of 1992–93 bachelor's degree recipients' teaching status, by academic and teacher pipeline characteristics: 2003—Continued**

Academic and pipeline characteristics	Taught at some point			Never taught
	Total	Currently teaching	Not currently teaching	
<b>Highest degree attained</b>				
Bachelor's degree	0.56	0.38	0.45	0.56
Post-baccalaureate certificate	6.96	7.38	3.37	6.96
Master's degree	1.50	1.34	1.04	1.50
Post-master's certificate, doctorate, or first professional degree	1.29	0.40	1.15	1.29
<b>Teaching experience before 1992–93 bachelor's</b>				
Taught or trained	3.06	4.25	4.24	3.06
Neither taught nor trained	0.57	0.39	0.42	0.57
<b>Teacher pipeline status at 1994 interview</b>				
Was not considering teaching	0.33	0.29	0.16	0.33
Was considering	1.31	1.23	0.96	1.31
Had taught but not prepared	0.00	3.21	3.21	†
Had prepared but not taught	4.06	3.28	2.26	4.06
Had prepared and taught	0.00	2.43	2.43	†

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

**Table C-3. Standard errors for table 3 and figures 6 and 7: Among 1992–93 bachelor's degree recipients who were current or former teachers, percentage distributions by characteristics of current or most recent school and teaching job: 2003**

School and job characteristics	Teaching status in 2003	
	Currently teaching	Not currently teaching
Total	†	†
Sector		
Public	1.03	1.61
Private	1.03	1.61
Level		
Elementary	1.88	2.39
Secondary	1.79	2.48
Combined	0.90	1.35
Percent minority enrollment		
0–4	1.51	2.30
5–19	1.64	2.34
20–49	2.52	1.56
50 or more	2.04	1.95
Percent free or reduced-price lunch recipients		
0–4	1.54	1.40
5–19	1.61	2.70
20–49	1.86	2.81
50 or more	1.78	2.33
Community type		
Central city	2.26	2.02
Urban fringe/large town	1.60	2.26
Small town/rural	1.76	2.18
Main teaching field		
General elementary	2.03	2.34
Business and vocational	0.53	1.77
Science or mathematics	1.72	2.03
Foreign languages	0.64	1.81
Special/ESL/bilingual education	1.13	1.57
English	1.34	1.54
Social studies	0.82	1.21
Fine arts	0.64	1.10
Other	1.45	1.42

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

**Table C-4. Standard errors for table 4 and figures D, 9, and 10: Among 1992–93 bachelor's degree recipients who were teaching in 2003, percentage distribution of length of time they expected to stay in teaching, and percentage who would choose teaching again, by demographic, academic, and teaching job characteristics: 2003**

Demographic, academic, and job characteristics	Length of time expect to stay in teaching				Would choose teaching again
	Rest of working life	Until non- teaching job in education comes along	Until something better comes along	Other	
Total	2.19	1.08	1.55	1.72	1.53
Gender					
Male	4.16	3.06	2.94	3.39	1.70
Female	2.50	1.23	1.62	1.96	1.96
Race/ethnicity					
White	2.10	1.05	1.37	1.73	1.55
Black	9.79	6.14	9.34	9.36	7.56
Hispanic	13.24	3.15	7.65	10.69	0.96
College entrance exam scores					
Lowest quarter	4.32	1.65	2.09	3.68	2.80
Middle two quarters	3.38	1.84	2.12	2.42	2.13
Highest quarter	5.48	2.74	4.34	4.20	4.05
Test scores not available	5.62	2.78	3.39	4.56	3.03
Baccalaureate degree major					
Education	2.62	1.20	1.53	2.20	1.84
Arts and humanities	8.45	4.07	3.29	4.95	4.06
Social/behavioral sciences	10.13	3.71	6.70	9.23	5.92
Science, mathematics, or engineering	6.96	2.32	4.06	6.96	2.57
Other	6.59	5.68	4.34	3.97	2.34
Normalized undergraduate GPA					
2.25–2.74	6.41	2.62	4.20	4.80	3.52
2.75–3.24	3.94	2.30	2.53	2.64	2.21
3.25–3.74	3.19	1.97	2.20	3.04	2.00
3.75 or higher	5.42	3.08	3.04	3.94	3.50
Bachelor's degree-granting institution					
Public non-doctorate-granting	3.41	1.47	2.71	2.24	2.30
Public doctorate-granting	3.64	2.65	2.33	3.01	2.07
Private not-for-profit non-doctorate-granting	5.82	2.26	3.02	4.51	2.80
Private not-for-profit doctorate-granting	6.43	3.58	1.86	5.12	4.28

See notes at end of table.

**Table C-4. Standard errors for table 4 and figures D, 9, and 10: Among 1992–93 bachelor's degree recipients who were teaching in 2003, percentage distribution of length of time they expected to stay in teaching, and percentage who would choose teaching again, by demographic, academic, and teaching job characteristics: 2003—Continued**

Demographic, academic, and job characteristics	Length of time expect to stay in teaching				Would choose teaching again
	Rest of working life	Until non-teaching job in education comes along	Until something better comes along	Other	
<b>Highest degree attained</b>					
Bachelor's degree	2.56	1.35	1.86	2.26	2.28
Master's degree	3.92	2.36	2.37	2.77	1.78
<b>Sector</b>					
Public	2.42	1.12	1.70	1.87	1.62
Private	6.22	2.24	2.97	4.37	3.83
<b>Level</b>					
Elementary	2.81	1.49	1.56	2.04	1.78
Secondary	3.42	2.44	3.08	3.03	1.93
Combined	8.20	3.51	5.36	6.62	5.02
<b>Percent minority enrollment</b>					
0–4	4.12	1.90	2.80	2.72	2.38
5–19	3.83	2.15	1.87	3.42	2.18
20–49	4.74	2.45	3.47	3.39	2.93
50 or more					
<b>Percent free or reduced-price lunch recipients</b>					
0–4	6.81	5.91	4.74	5.72	2.50
5–19	3.68	1.51	2.84	3.76	2.18
20–49	3.41	1.53	2.14	2.01	2.21
50 or more	5.61	2.67	3.23	4.79	3.47
<b>Employment status</b>					
Full-time	2.35	1.08	1.53	1.79	1.58
Part-time	8.63	4.43	5.75	8.55	3.82
<b>Main teaching field</b>					
General elementary	3.63	1.09	2.24	3.02	2.82
Science or mathematics	4.92	2.98	2.91	3.76	2.18
Special/ESL/Bilingual education	7.09	5.83	5.77	4.68	3.59
English	6.42	2.97	4.23	5.45	3.35
Social studies	6.99	3.84	3.46	4.95	5.00
Art, drama, or music	9.62	2.67	8.13	11.97	3.51
Other	6.11	3.67	5.08	5.43	4.27

See notes at end of table.

**Table C-4. Standard errors for table 4 and figures D, 9, and 10: Among 1992–93 bachelor's degree recipients who were teaching in 2003, percentage distribution of length of time they expected to stay in teaching, and percentage who would choose teaching again, by demographic, academic, and teaching job characteristics: 2003—Continued**

Demographic, academic, and job characteristics	Length of time expect to stay in teaching				Would choose teaching again
	Rest of working life	Until non- teaching job comes along	Until something better comes along	Other	
Satisfied with teaching overall					
Yes	2.13	1.07	1.43	1.83	1.36
No	9.23	4.25	6.63	6.15	7.17

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

**Table C-5. Standard errors for table 5 and figure 11: Among 1992–93 bachelor's degree recipients who had taught but were not teaching in 2003, percentage distribution of their main reason for leaving teaching, by demographic, academic, and teaching job characteristics: 2003**

Demographic, academic, and teaching job characteristics	Main reason not teaching in 2003									
	To raise a family or other family-related reasons	To work outside of education	To change to non-teaching job in education	Difficulty with students, parents, Low or admin-pay	Laid off or work-force reduction	Relocated	Health reasons	To take a sabbatical or break from teaching	Other	
Total	2.11	3.64	2.35	2.65	1.49	1.02	1.30	0.48	0.36	2.83
Gender										
Male	0.65	8.24	4.81	4.92	2.56	0.62	3.37	1.12	1.05	6.00
Female	2.83	2.06	2.52	2.41	1.83	1.53	0.84	0.44	†	3.11
College entrance exam scores										
Lowest quarter	6.52	5.76	4.33	7.42	2.78	5.36	1.99	†	†	4.94
Middle two quarters	3.87	5.80	4.41	3.05	2.62	0.80	0.83	0.55	0.55	2.79
Highest quarter	5.80	8.62	5.06	7.56	3.49	1.60	0.99	1.43	1.55	7.71
Test scores not available	3.78	9.67	4.52	4.38	2.86	2.51	7.29	1.93	†	10.65
Baccalaureate degree major										
Education	4.63	2.31	4.69	4.68	3.80	0.95	1.07	0.32	†	3.40
Arts and humanities	4.65	11.79	2.70	5.19	3.55	†	6.08	1.28	1.22	10.37
Social/behavioral sciences	6.18	8.25	3.19	5.08	†	10.17	†	3.41	†	10.91
Science, mathematics, or engineering	3.20	12.43	5.04	6.97	3.97	3.91	†	†	†	9.41
Other	9.70	6.80	7.12	5.30	2.12	4.07	1.84	2.63	†	5.53
Normalized undergraduate GPA										
2.25–2.74	5.28	10.50	5.33	8.23	4.47	1.40	1.72	1.48	†	6.32
2.75–3.24	4.43	8.37	4.75	2.85	2.12	0.53	0.97	†	1.17	4.13
3.25–3.74	5.42	4.74	3.72	3.88	3.03	1.31	0.81	1.44	†	5.05
3.75 or higher	6.52	4.28	4.54	6.64	3.07	6.18	6.88	†	†	6.87

See notes at end of table.

**Table C-5. Standard errors for table 5 and figure 11: Among 1992–93 bachelor's degree recipients who had taught but were not teaching in 2003, percentage distribution of their main reason for leaving teaching, by demographic, academic, and teaching job characteristics: 2003**  
**—Continued**

Demographic, academic, and teaching job characteristics	Main reason not teaching in 2003								
	To raise a family or other family-related reasons	To work outside of education	To change job in education	Difficulty with students, parents, Low or admin-pay	Laid off or work-force reduction	Relocated	Health reasons	To take a sabbatical or break from teaching	Other
<b>Bachelor's degree-granting institution</b>									
Public non-doctorate-granting	6.29	2.02	5.93	3.47	4.41	1.10	2.20	2.02	† 6.35
Public doctorate-granting	3.45	6.36	4.45	4.01	2.40	2.38	0.51	† 0.77	3.78
Private not-for-profit non-doctorate-granting	3.75	6.04	4.44	5.35	2.45	†	1.15	0.90	† 6.96
Private not-for-profit doctorate-granting	5.91	8.04	4.96	4.89	3.40	1.15	7.44	2.00	† 6.06
<b>Highest degree attained</b>									
Bachelor's degree	3.84	4.57	2.56	3.78	2.36	0.86	2.10	† 0.45	3.63
Master's degree	2.82	5.88	4.74	4.70	1.60	3.15	0.90	1.21	0.80 3.14
<b>Preparation for teaching</b>									
Had taught but not prepared	2.20	6.41	3.33	2.89	1.91	2.62	3.23	0.68	0.71 6.80
Had prepared and taught	3.53	3.73	2.96	3.44	2.31	0.87	0.72	0.65	0.41 2.38
<b>Sector of school</b>									
Public	2.43	4.18	2.46	3.01	1.83	1.29	0.46	0.61	0.47 2.50
Private	3.67	5.38	5.70	3.19	2.59	†	5.65	†	† 6.45
<b>Level of school</b>									
Elementary	3.17	5.97	3.25	3.37	2.02	1.01	0.61	0.59	0.70 3.86
Secondary	3.70	5.52	3.49	3.31	2.27	2.37	2.87	1.06	† 2.96
Combined	5.19	5.42	5.07	4.90	3.55	†	3.83	†	† 7.61
Satisfied with teaching overall	1.85	3.49	2.54	3.85	2.12	1.67	0.77	0.67	0.63 3.50

See notes at end of table.

**Table C-5. Standard errors for table 5 and figure 11: Among 1992–93 bachelor's degree recipients who had taught but were not teaching in 2003, percentage distribution of their main reason for leaving teaching, by demographic, academic, and teaching job characteristics: 2003**  
**—Continued**

Demographic, academic, and teaching job characteristics	Main reason not teaching in 2003								
	To raise a family or other family-related reasons	To work outside of education	To change job in education	Difficulty with students, parents, Low or admin-pay	Laid off or work-force reduction	Relocated	Health reasons	To take a sabbatical or break from teaching	Other
<b>Percent minority enrollment</b>									
0–4	5.46	12.15	4.27	4.11	3.40	†	†	†	7.14
5–19	5.64	4.53	6.30	6.51	2.83	1.79	1.08	0.57	† 5.66
20–49	5.67	4.92	5.20	4.91	2.85	1.54	1.57	†	† 5.12
50 or more	3.84	3.60	4.21	3.88	2.51	3.00	3.52	1.40	1.09 5.00
<b>Percent free or reduced-price lunch recipients</b>									
5–19	4.88	9.91	4.26	5.07	2.54	1.91	†	†	† 4.46
20–49	5.34	3.78	3.65	4.10	3.50	3.45	0.82	1.62	1.02 4.12
50 or more	5.46	4.23	4.89	7.06	3.46	1.18	0.75	1.23	1.22 5.20
<b>Main teaching field</b>									
General elementary	5.79	3.38	5.04	2.63	3.09	1.79	0.50	1.34	† 4.87
Science or mathematics	4.44	9.77	10.87	6.05	5.06	†	†	2.32	† 5.71
Special/ESL/Bilingual education	13.88	4.95	9.22	3.97	4.44	3.36	†	†	† 11.98
English	9.65	5.53	4.80	10.39	5.37	†	†	†	† 6.87
Other	2.38	6.58	7.24	9.42	2.47	†	2.58	2.64	2.87 8.60

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

**Table C-6. Standard errors for table 6 and figure 12: Percentage distribution of 1992–93 bachelor's degree recipients' status in the teacher pipeline, by demographic, academic, and teacher pipeline characteristics: 2003**

Demographic, academic, and teacher pipeline characteristics	No entry into pipeline	Considered or applied at some point	Has taught, no training	Prepared, did not teach	Prepared and taught
Total	0.59	0.65	0.25	0.31	0.62
Gender					
Male	0.95	1.01	0.37	0.42	0.64
Female	0.95	0.81	0.29	0.45	0.86
Race/ethnicity					
White	0.70	0.74	0.24	0.33	0.74
Black	3.47	2.57	1.12	0.66	2.06
Hispanic	4.09	2.86	1.16	1.06	2.69
Asian/Pacific Islander	3.86	3.00	1.17	2.12	1.75
Age at bachelor's degree completion					
22 or younger	0.89	0.82	0.39	0.39	0.72
23–24	1.58	1.51	0.44	0.42	1.10
25–29	2.55	2.57	0.85	0.90	1.53
30 or older	1.71	1.72	0.55	1.07	1.48
Attainment before 1992–93 bachelor's					
Associate's degree or less	0.60	0.64	0.26	0.31	0.67
Bachelor's degree or more	2.46	2.58	1.14	1.57	2.17
Bachelor's degree-granting institution					
Public non-doctorate-granting	1.60	1.41	0.46	0.77	1.29
Public doctorate-granting	1.05	0.92	0.38	0.46	0.93
Private not-for-profit non-doctorate-granting	1.65	1.67	0.62	0.56	1.15
Private not-for-profit doctorate-granting	2.15	2.11	0.92	0.83	1.24
Private for-profit 2-year-or-more	15.30	15.99	0.93	†	0.80
Baccalaureate degree major					
Business and management	1.54	1.41	0.46	0.51	0.59
Education	1.02	1.10	0.44	1.43	2.08
Health	2.64	2.96	0.67	0.85	1.57
Arts and humanities	2.26	2.98	1.38	1.06	2.00
Social/behavioral sciences	1.73	1.56	0.44	0.59	0.80
Science, mathematics, or engineering	1.42	1.45	0.48	0.58	0.68
Other	1.70	1.65	0.57	1.02	1.22

See notes at end of table.

**Table C-6. Standard errors for table 6 and figure 12: Percentage distribution of 1992–93 bachelor's degree recipients' status in the teacher pipeline, by demographic, academic, and teacher pipeline characteristics: 2003—Continued**

Demographic, academic, and teacher pipeline characteristics	No entry into pipeline	Considered or applied at some point	Has taught, no training	Prepared, did not teach	Prepared and taught
College entrance examination score					
Lowest level	1.85	1.51	0.55	0.67	0.89
Middle level	1.03	1.12	0.39	0.43	0.88
Highest level	1.79	1.54	0.59	0.57	0.96
Test scores not available	1.84	1.75	0.62	0.94	1.44
Normalized undergraduate GPA					
Less than 2.25	3.62	3.26	1.38	1.38	1.16
2.25–2.74	1.77	1.80	0.44	0.50	0.99
2.75–3.24	1.29	1.08	0.46	0.44	1.23
3.25–3.74	1.08	1.16	0.42	0.45	1.22
3.75 or higher	2.15	2.02	0.98	1.55	1.53
Teaching experience before 1992–93 bachelor's					
Taught or prepared	†	1.00	4.02	3.00	4.70
Neither taught nor prepared	0.66	0.72	0.23	0.29	0.51
Teacher pipeline status through 1994 interview					
Was not considering teaching	0.83	0.82	0.15	0.27	0.26
Was considering	0.05	1.52	0.68	0.59	1.37
Had taught but not prepared	†	†	3.61	†	3.61
Had prepared but not taught	†	†	†	4.06	4.06
Had prepared and taught	†	†	†	†	†

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&amp;B:93/03).

**Table C-7. Standard errors for table 7 and figures E and 13: Percentage distribution of 1992–93 bachelor's degree recipients' preparation to teach, by demographic, academic, and teacher pipeline characteristics: 2003**

Demographic, academic, and teacher pipeline characteristics	No student teaching or certification	Student taught	Certified
Total	0.64	0.29	0.67
Gender			
Male	0.74	0.39	0.60
Female	0.95	0.38	1.01
Race/ethnicity			
White	0.77	0.29	0.76
Black	2.35	0.74	2.08
Hispanic	3.28	1.04	3.34
Asian/Pacific Islander	2.41	2.03	2.06
Age at bachelor's degree completion			
22 or younger	0.74	0.38	0.75
23–24	1.16	0.32	1.06
25–29	1.57	0.71	1.46
30 or older	1.71	0.77	1.65
Attainment before 1992–93 bachelor's			
Associate's degree or less	0.68	0.26	0.70
Bachelor's degree or more	2.60	1.72	2.06
Bachelor's degree-granting institution			
Public non-doctorate-granting	1.33	0.75	1.25
Public doctorate-granting	0.98	0.39	0.94
Private not-for-profit non-doctorate-granting	1.24	0.71	1.26
Private not-for-profit doctorate-granting	1.49	0.67	1.39
Private for-profit 2-year-or-more	0.80	0.60	0.68
Baccalaureate degree major			
Business and management	0.80	0.39	0.73
Education	1.60	0.98	1.85
Health	1.70	1.10	1.46
Arts and humanities	2.43	0.93	2.16
Social/behavioral sciences	1.05	0.61	0.95
Science, mathematics, or engineering	0.89	0.41	0.79
Other	1.37	0.73	1.26
College entrance examination score			
Lowest level	1.14	0.71	1.03
Middle level	0.80	0.40	0.83
Highest level	1.04	0.50	0.94
Test scores not available	1.55	0.56	1.48

See notes at end of table.

**Table C-7. Standard errors for table 7 and figures E and 13: Percentage distribution of 1992–93 bachelor's degree recipients' preparation to teach, by demographic, academic, and teacher pipeline characteristics: 2003—Continued**

Demographic, academic, and teacher pipeline characteristics	No student teaching or certification	Student taught	Certified
Normalized undergraduate GPA			
Less than 2.25	1.66	1.20	1.19
2.25–2.74	1.04	0.42	0.92
2.75–3.24	1.30	0.40	1.26
3.25–3.74	1.26	0.36	1.31
3.75 or higher	1.88	1.32	1.88
Teaching experience before 1992–93 bachelor's			
Taught or prepared	3.93	1.88	4.63
Neither taught nor prepared	0.58	0.28	0.56
Teaching status in 2003 and before 1992–93 bachelor's			
Currently teaching, taught before bachelor's	†	2.84	2.84
Currently teaching, not before bachelor's	0.95	0.89	1.35
Had taught, taught before bachelor's	†	†	†
Had taught, not before bachelor's	2.45	1.02	2.64
Never taught	0.37	0.28	0.27
Teacher pipeline status through 1994 interview			
Was not considering teaching	0.37	0.30	0.30
Was considering	1.57	0.48	1.47
Had taught but not prepared	3.61	2.19	3.23
Had prepared but not taught	†	2.20	2.20
Had prepared and taught	†	0.67	0.67

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

**Table C-8. Standard errors for table 8 and figure 14: Of 1992–93 bachelor's degree recipients who had entered the teacher pipeline but neither taught nor applied for a teaching position, percentage who cited various reasons for deciding against teaching, by demographic, academic, and teacher pipeline characteristics: 2003**

Demographic, academic, and teacher pipeline characteristics	Not interested in teaching	Already in other job	Wanted higher salary	Other reason	Not yet certified	Have not taken tests	Teachers' working conditions	Received better offer	Have not passed tests
Total	0.95	1.17	1.38	0.99	0.68	0.79	0.69	0.49	0.33
Gender									
Male	1.65	1.98	2.19	1.52	1.01	0.99	1.01	0.86	0.53
Female	1.28	1.44	1.62	1.38	1.04	1.07	0.93	0.54	0.34
Race/ethnicity									
White	0.96	1.23	1.51	1.06	0.78	0.96	0.78	0.50	0.35
Black	5.78	5.44	3.60	4.00	2.54	3.67	1.15	2.45	0.84
Hispanic	4.97	5.01	4.95	4.86	3.06	3.83	3.31	2.00	1.37
Asian/Pacific Islander	7.31	5.68	5.14	6.11	4.12	3.69	3.25	2.96	3.17
Attainment before 1992–93 bachelor's									
Associate's degree or less	1.08	1.27	1.39	0.99	0.75	0.85	0.73	0.47	0.35
Bachelor's degree or more	6.17	4.99	3.22	4.34	3.68	2.43	1.05	2.00	0.75
Bachelor's degree-granting institution									
Public non-doctorate-granting	2.68	2.66	2.85	1.59	2.09	1.55	1.52	0.99	0.45
Public doctorate-granting	1.93	2.35	2.08	1.74	1.51	1.21	1.05	0.72	0.68
Private not-for-profit non-doctorate-granting	2.54	2.35	2.29	1.60	2.29	2.28	1.33	1.01	0.58
Private not-for-profit doctorate-granting	2.87	2.87	3.12	3.14	2.40	1.78	1.33	1.56	1.02
Baccalaureate degree major									
Business and management	2.60	3.18	3.43	2.30	2.33	2.86	1.97	1.12	0.90
Education	4.78	3.74	3.15	3.92	2.74	2.57	2.63	3.03	1.06
Health	4.01	4.02	3.89	4.49	1.69	1.31	1.11	0.94	0.65
Arts and humanities	3.92	3.40	3.27	3.24	2.42	2.35	1.57	1.99	0.80
Social/behavioral sciences	2.14	2.41	2.69	1.97	2.07	1.15	0.95	0.59	0.48
Science, mathematics, or engineering	2.62	2.86	2.65	1.83	1.78	2.13	1.34	0.99	0.76
Other	2.99	3.57	2.65	2.03	2.78	2.13	1.69	1.39	0.45

See notes at end of table.

**Table C-8. Standard errors for table 8 and figure 14: Of 1992–93 bachelor's degree recipients who had entered the teacher pipeline but neither taught nor applied for a teaching position, percentage who cited various reasons for deciding against teaching, by demographic, academic, and teacher pipeline characteristics: 2003—Continued**

Demographic, academic, and teacher pipeline characteristics	Not interested in teaching	Already in other job	Wanted higher salary	Other reason	Not yet certified	Have not taken tests	Teachers' working conditions	Received better offer	Have not passed tests
College entrance examination score									
Lowest level	2.79	3.01	2.82	2.70	2.20	1.95	0.90	1.56	0.53
Middle level	1.80	2.01	2.20	1.44	1.36	1.27	1.08	0.71	0.42
Highest level	1.68	2.38	2.30	1.85	1.64	1.65	1.22	1.23	1.03
Test scores not available	3.04	1.92	2.72	2.17	2.46	2.43	1.27	0.80	0.43
Normalized undergraduate GPA									
Less than 2.25	4.22	5.45	6.91	4.23	4.43	3.09	2.63	1.19	1.60
2.25–2.74	2.64	2.47	1.99	1.85	2.22	1.75	1.26	0.79	0.88
2.75–3.24	1.94	1.84	1.78	1.98	1.62	1.80	1.09	1.19	0.62
3.25–3.74	2.22	2.09	2.37	1.56	1.88	1.87	0.90	0.91	0.59
3.75 or higher	4.75	2.95	3.66	3.33	2.30	1.92	2.60	1.42	0.99
Teaching experience before 1992–93 bachelor's									
Neither taught nor prepared	0.94	1.23	1.40	0.99	0.66	0.77	0.70	0.53	0.31
Teacher pipeline status through 1994 interview									
Was not considering teaching	0.97	1.44	1.81	1.27	1.03	0.94	0.83	0.60	0.33
Was considering	2.55	2.30	2.44	1.30	1.69	1.81	1.11	0.86	0.65
Had prepared but not taught	6.69	5.41	3.53	5.81	2.85	3.39	2.35	4.35	2.45

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

**Table C-9. Standard errors for figure C and figure 8: Among 1992–93 bachelor's degree recipients who were teaching in 2003, percentages who were satisfied with teaching overall and with various aspects of teaching: 2003**

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Satisfied with teaching overall	0.86
Very satisfied with:	
Pay	1.91
Support from parents	2.2
Student motivation to learn	2.24
Student discipline, behavior	1.92
Class size	2.06
School learning environment	1.81

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SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).